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POWDERED DRUGS UNDER THE MICROSCOPE.

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I. PRELIMINARY.

The writer proposes, in this and, perhaps, several succeeding articles, to point out to pharmacists the utility of the microscope as a means of identifying powdered drugs, and of ascertaining their purity. He does this because he is convinced that, notwithstanding the writings of Hassall, Pocklington, Flückiger, Planchon and some others, the practical usefulness and ready availability of the microscope as a means of organic analysis, is not fully appreciated.

This instrument is especially useful in the examination of organic bodies. One would expect that when two parts of plants differ in external appearance, corresponding differences would exist in the minute structure as well, and such is found to be the case. It is not too much to say that, for those having the necessary previous knowledge, it is no harder to distinguish two powders under the microscope than it is to distinguish the two bodies from which the powders are derived. There is no more difficulty in telling ground mustard from ground horse-radish, and, where they are mixed, in picking the one out from the other, than there is in telling the mustard-seed and the horse-radish-root. Wherever any powdered drug has traces of organic structure, the microscope can identify them and ascertain their source. In these cases the use of the microscope can properly accompany the work of chemical analysis. It can precede and indicate what the chemist is to look for, or it can follow and verify the results of his work. In some cases, indeed, microscopical analysis can do successful labor in fields where chemistry is powerless. Chemistry, for instance, cannot distinguish between the various starches—wheat-starch, corn, potato, arrow root, sago starch, etc.; it can only show

that amylaceous matter is present. The microscope, on the other hand, can easily distinguish between them.

One great advantage in the use of the microscope is the readiness with which results can be obtained from it. But a moment is needed by the skilled microscopist to distinguish the various starches, or to analyze the various proprietary flours, prepared foods, farinas, etc.; and even such complicated mixtures as the tooth-powders can be unraveled in a short time. The chemist would have to spend much time over the latter, if, indeed, he could succeed in performing it at all.

For the work contemplated in these papers a complicated and costly instrument, with all the modern expensive appliances, is not required; an inexpensive microscope, with a magnifying power of 200 or 300 diameters, is sufficient. One of the cheaper compound microscopes, with an inch objective, can be made to answer, a half inch or a quarter inch objective should be added as soon as practicable, as it will be sometimes needed. They can be obtained of any reputable maker or dealer at prices varying from $25.00 to $150.00, depending on the character of the workmanship and number of objectives and accessories.

Instructions concerning the use of the microscope must be looked for in books devoted to that subject. With cleanliness, care and some patience any one can use the instrument successfully. When the tissue of a drug is to be examined, it should be softened by soaking in water, or some other fluid, and then as thin sections as possible be taken in several directions. The sections can be transferred to a glass slip by means of a camel's hair brush. They should be deposited in a drop of water and covered by thin glass when they are ready for examination. If greater transparency is required, the sections can be placed in glycerin; still greater transparency can be obtained by placing dry sections in Canada balsam. If a powder is to be examined, a very small part of it should be placed on the glass-slip in water, glycerin or Canada balsam.

II. STARCHES.

The starches form powders of a simple nature, with which the unpractised observer will do well to begin. They vary very much in form, size and structure, and to some extent in chemical characteristics.

The *color* of starch is usually pure white. In some cases a tinge of blue can also be seen, as in some wheat-starch, while the starch from the potato has a slightly yellowish cast. The fineness of the starch powder depends on the *size* of the individual grains, except where the grains are artificially agglomerated, as in sago and tapioca; the former is in small, round, brownish grains, while tapioca is in larger, irregular, white fragments. The individual starch grains vary much in size, though they are pretty constant for any given species. The various sizes will be described in the special descriptions to follow; here it is sufficient to say that oat, rice and rye starches represent the smallest grains, while those of corn starch are not much larger. The medium size is found in the grains of wheat and arrow-root starch. The largest grains are found in potato and canna starch. In the last two the unaided eye can distinguish the largest individual grains, but in nearly all others they can be seen only under the microscope. The *specific gravity* is more than that of water, though it varies much with the state of dryness of the starch. Its average is given, by Wiesner, at 1·5. It, however, varies with the different species of starch. The grains contain considerable water—as high as 30 per cent. when fresh, reduced sometimes to 7 per cent., when air dry.

The grains, when exposed under the microscope to hot water (140° F. or above) swell, then burst, and finally form a homogeneous paste. The same process occurs, and can be easily observed, microscopically, when they are tested with dilute alkalies or mineral acids. They are insoluble in cold water, alcohol and ether. The grains turn blue when brought in contact with a solution of iodine, a simple solution of iodine in water is sufficient for this very delicate test. This is a very satisfactory test for microscopical use, as it will betray at once the smallest proportion of starch in the tissue under examination. The iodine solution can be applied in this way: the tissue or powder to be examined is placed on the glass slide in a drop of water, and a thin glass cover is placed over it; it is then placed under the microscope and focussed, the stage of the microscope being tilted a little, if practicable; a drop of the iodine solution is then placed on the slide, at the upper edge of the cover. It will gradually spread in the water and through the tissue examined; meantime the eye at the microscope watches the changes it causes. Should it not draw through readily, a bit of blotting paper, placed at the opposite edge of the glass cover,

will take up the water, and the iodine solution will come in to take its place. The color of the starch grains affected by iodine, although usually blue, may vary, according to the amount of the iodine, from a light violet, through blue, to blue-black.

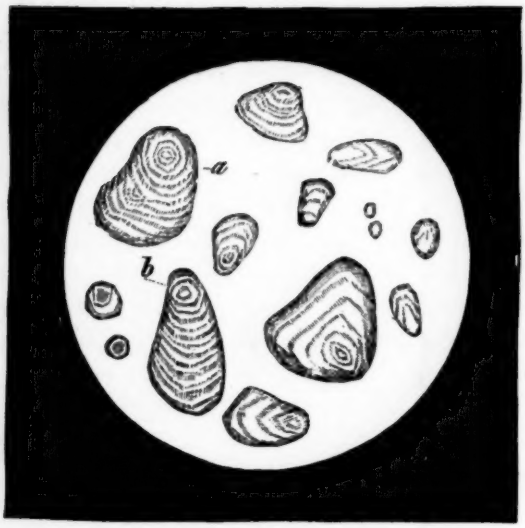

FIG. 1. Grains of potato starch. *a* and *b* are from a fresh potato, the others have been dried.

Under the microscope the starch-grains present the form of minute grains, of a form and structure characteristic for each species. They are usually bounded by curved surfaces, — spherical, elliptical, egg-shaped, lens-shaped, etc., but sometimes they have flat surfaces as well. They usually contain a dark spot, line or cross within, which is sometimes central, sometimes eccentric. This spot is called the nucleus and is usually small and round in starch found in fresh tissues, slit or cross-shaped in grains which have been dried (Fig. 1).[1]

The position and character of the nucleus affords a valuable means of describing the grains. The grains, also, frequently show a series of rather faint lines concentric about the nucleus. When present, they sometimes can be distinguished only with careful focussing and close examination, and in many starches they are entirely absent. Sometimes the grains have more than one nucleus (Fig. 1, *a*) in which case they are said to be compouud. The compound grains may consist of only two simple ones, as in tapioca, or three, as usually in sago, or of a great many, as in rice, oat and buckwheat.[2]

[1] All the figures in these papers were drawn from nature, by LOUISA M. REED, of ANN ARBOR, MICH., whose work is accurate and careful, as can be tested by comparing it with the actual objects.

[2] For those who wish to study the microscopical characters of starch more in

Having given the general characters of the starch powders, we will now pass on to the consideration of the species of interest to the pharmacist.

I. POTATO-STARCH (Fig. 1).

This starch is not officinal, but the ease of obtaining it and the size of the grains make it the best and most convenient form for the inexperienced microscopist to begin with. Besides, it is frequently used and still more frequently named as an adulterant of other powders and is, consequently, important to the pharmacist. For examination fresh, it can be easily obtained from the potato, nearly the whole of the interior of which is made up of it.

It forms a fine, white, glistening powder, with small, irregular, pulverulent masses intermixed. It crackles slightly when rubbed between the fingers. When examined carefully, it can be seen to have a yellowish cast of color. It has a slight taste like raw potato, and a faint acrid odor. The latter is brought out more decidedly by the application of alcohol or chlorhydric acid.

The grains vary much in size, due, probably, to unequal development, the youngest being smallest, the greatest length attained is about 50*tt*.[1] The form is usually oval, egg-shaped, elliptical or round-triangular. The smallest and youngest grains are nearly spherical. The

detail, the following references may prove useful: Hassall's *Adulteration in Food and Medicine*; Soubeiran, *Dictionnaire des Falsifications*; Wiesner, *Rohstoffe des Pflanzenreiches*, pp. 239–289; Planchon, *Détermination des drogues simples*, Vol. II, chap. XIII; Harrington, *American Naturalist*, April and June, 1875, Vol. IX, pp. 193–198, 339–346.

For the examination of starch, Thomas Greenish recommends especially the following:

"Saturate distilled water with creosote, and take of
the filtered solution, ... ℥v
Spirit of wine, ... ℥iss
Glycerin, ... ℥iss."

The starch could, probably, be preserved, in this solution, as a permanent microscopical specimen.

[1] *tt*=ten-thousandths of an inch. For information as to methods of measurement, the works on microscopy must be consulted. Where the pharmacist has not access to them, the measurements given will be useful to him by indicating the relative size of the bodies measured. The writer uses the small unit *tt*. so that fractions can be avoided, and the comparison of length can be made readily, without reduction. Fractions of inch are used because they are much more generally used and understood in this country than millimeters.

nucleus is near the smaller end. The distance from it to the smaller end is usually ¼ to ⅙ of that to the larger end. The grains are almost invariably simple, but occasionally one with two nuclei is found (Fig. 1, *a*), and very rarely one with three nuclei.

Potato-starch is much used in the arts for making a stiffening paste, and for other purposes. It is said to be sometimes surreptitiously replaced by poor grades of wheat-starch (Wiesner). It is also sometimes mixed with ground fibre (probably woody), and is adulterated with earthy matter (Soubeiran). Its use as an adulterant of arrow-root and other starches and drugs has already been mentioned.

In the next number, the most important of the other pharmacal starches will be described and figured.

ANALYSIS OF CINCHO-QUININE.

BY EBENEZER M. WELLS, PH.G.

(*Abstract from an Inaugural Essay.*)

Several years ago, a preparation called Cincho-Quinine was thrown upon the market, which is represented as having all the constituents of cinchona-bark in their alkaloidal condition, and as being fully equal to sulphate of quinia in therapeutical effect, when given in the same dose. By diligent and profuse advertising, and being sold at a lower price than sulphate of quinia, it has, in many localities, gained considerable favor, and is frequently prescribed by some practitioners as a substitute for sulphate of quinia, solely upon the testimonials in the circulars, which accompany each bottle, and from which it appears that many have used this nostrum with success.

This nostrum was analyzed in 1870 by Wm. T. Wenzell, in 1874 by Albert E. Ebert, in 1875 by Profs. Scheffer and Diehl, and in 1875 by Profs. S. P. Sharples, F. A. Genth and others. Neither Wenzell nor Ebert were successful in determining the presence of quinia, Profs. Scheffer and Diehl found quinia, quinidia, and probably cinchonidia ("Amer. Journ. Pharm.," April, 1875) in very small quantities. The other analysts succeeded in determining the presence of quinia, quinidia and cinchonidia, besides cinchonia ("Drug. Cir.," April, 1875, p. 85); but the amount of each is not stated, which in justice to the public at large should have been done.

What is cincho-quinine? Does it really contain quinia, and how

much? are questions which have often been put to me by both physicians and customers. I could not give the desired information, and have therefore determined to subject this nostrum to a chemical analysis.

I used for my experiments two samples of cincho quinine, which I shall designate as "new" and "old." The new sample had been obtained from the manufacturers through Powers & Weightman, from whom I purchased it in December, 1875. The old sample I procured through Prof. J. M. Maisch, from Mr. J. L. Lemberger, of Lebanon, Pa., who obtained it from a New York agency July 18th, 1873. The experiments were made in the laboratory of the Philadelphia College of Pharmacy, under the supervision of Prof. Maisch.

The qualitative examination of cincho-quinine was conducted in the same manner as detailed by Profs. Scheffer and Diehl in the paper referred to above, and gave the same results, proving the presence of ammonium sulphate, cinchonia sulphate and cinchona alkaloids, also a small quantity of organic matter, which could not be dissolved in alcohol, but remained behind with the ammonium sulphate, and with it was soluble in water.

To determine the amount of the various constituents of this nostrum, De Vrij's method for separating the cinchona alkaloids was first tried; but it soon became apparent that this method would not yield correct results, in consequence of the great excess of cinchonia present. Mixtures of the alkaloid, in approximately the same proportion as they exist in this preparation, according to the published essays, were made; and, after trying several modifications, the following process was found to yield satisfactory results, and was therefore used in assaying both samples of cincho-quinine:

Six grams of the mixed cinchona alkaloids were dissolved in dilute hydrochloric acid, the solution precipitated by ammonia, the precipitate washed upon a filter with cold water, and then dried. The washings were evaporated to dryness, and the residue treated with ether; after evaporating the latter, a small quantity of alkaloid was left behind which was added to the larger portion, giving the total amount of alkaloids present, the loss from the original weight taken indicating non-alkaloidal compounds. The saline matter insoluble in ether was dissolved in water, in which it was readily soluble, and the sulphuric acid present determined in the usual manner by precipitating with chloride of barium. About one-half the dried alkaloids was then rubbed to a

fine powder—the other portion being reserved for verifying the results obtained—and macerated for thirty hours with sufficient ether to cover it, afterwards transferred to a filter, and washed with ether until at least four fluidounces of filtrate were obtained, which were evaporated in a beaker, the result indicating the total amount of alkaloids soluble in the quantity of ether employed. On treating this residue with 76 times its weight of ether, a residue was left, which, after dissolving in water by the aid of sulphuric acid, was not affected by chlorine water and ammonia, proving the complete absence of quinia and quinidia, nor could a precipitate be obtained on the addition of a concentrated solution of pure Rochelle salt and setting aside for two days; cinchonidia was therefore likewise absent, and the undissolved portion was cinchonia.

The etherial solution was again evaporated to dryness and the residue weighed, afterwards treated with 40 times its weight of water and sufficient sulphuric acid to obtain a solution, which was carefully neutralized by ammonia.

With the old cincho-quinine a perfect solution was obtained, but the new cincho-quinine left some greenish resinous globules behind, which would likewise not dissolve in boiling acidulated water. The filtered solution of the sulphate was treated with tartrate of sodium and potassium, and the precipitated tartrate of cinchonidia collected after two days, washed and dried; one part of this tartrate representing ·804 part of cinchonidia, the actual amount of this alkaloid present, is easily calculated.

The filtrate and washings from this precipitate were concentrated to the original measure and mixed with strong solution of potassium iodide in excess. On the following day, the precipitated hydriodate of quinidia was collected, washed and dried, and its weight multiplied with 0·718, to ascertain the total amount of this alkaloid.

The filtrate from the foregoing precipitate contained all the quinia. To avoid the solvent action of the chemicals previously added, upon the herapathite, it was determined not to estimate the quinia in this form, but to weigh it as pure alkaloid. Accordingly, the liquid was evaporated and the dry mass treated with ether, on evaporating the ether, iodide of ammonium was found in the residue. It was therefore dissolved in water, boiled with sufficient sulphuric acid to eliminate all hydriodic acid, precipitated by ammonia, and repeatedly agitated with fresh portions of ether, which, on evaporation, left pure quinia.

The amount of moisture contained in cincho-quinine was ascer-

tained by drying a weighed sample at about 150° F., and the ammonium by treating another portion of cincho-quinine with boiling alcohol, and weighing the undissolved portion as ammonium sulphate.

The results of these assays, calculated for 100 parts of material, were as follows:

	New sample.		Old sample.	
Sulphuric acid (SO_3),	6·516		5·016	
Ammonium (NH_4),	1·360		1·380	
Water, determined by heat,	4·098		3·174	
Loss (mainly water of crystallization),	0·359		0·040	
Total non-alkaloid matter,		12·333		9·610
Quinia,	0·466		0·240	
Quinidia,	1·250		1·820	
Cinchonidia,	0·717		0·920	
Resin and loss,	0·583			
Cinchonia,	1·384		2·440	
Total am't dissolved by 1st treatment with ether,		4·400		5·420
Cinchonia left undissolved on 1st treatm't with ether,		83·267		84·970
		100·000		100·000

The total amount of cinchonia, a portion of which is combined with sulphuric acid, was therefore 84·651 per cent. in the new, and 87·410 per cent. in the old sample, while the quinia was present in one case to the amount only of less than one-half, and in one sample less than one-quarter of 1 per cent.

Remarks by the Editor.—It will be of interest to recapitulate, in connection with the above essay, the quantitative results obtained in previous analyses, more particularly the amount of the three higher priced alkaloids, present in cincho-quinine, which form the correct basis for estimating its commercial as well as medicinal value. Wenzell obtained 2·5 per cent, Scheffer and Diehl (see "Amer. Jour. Phar.," 1875, p. 205), from four samples, 3·00, 3·25, 2·15 and 3·10 per cent., and Wells (4·400—1·384=) 3·016 and (5·420—2·440=) 2·980 per cent.; the average of these seven assays gives 2·86 per cent. of higher priced cinchona alkaloids, from which figure the lowest amount on record differs by ·71 or 25 per cent., and the highest amount recorded by ·39 or nearly 14 per cent., while the proportion of the lowest to the highest figure, 2·15 and 3·25, is as 2 : 3.

A still greater variation is observable in the percentage of quinia, small as it is; the lowest one found (Wells) being ·24, and the high-

est (Scheffer and Diehl) ·612 per cent., their proportion is nearly as 2 : 5.

Mr. Wells has estimated the amount of ammonium from which the ammonium sulphate in the two samples proves to be 5·44 and 5·52 per cent., representing respectively 3·40 and 3·45 of the sulphuric acid, which, deducted from the assayed amounts of the latter, leave 3·116 and 1·566 per cent. of SO_3 in combination with alkaloids. Allowing this to be combined with cinchonia, we find the following percentage of cinchonia sulphate (which contains 10·66 per cent. SO_3) in Wells' old sample 14·69, and in his new sample 29·23 per cent., or, within a slight fraction, double the amount. The amount of alkaloidal sulphate, approximately estimated by Scheffer and Diehl by treatment with cold water, varied in four samples between 11·75 and 22 per cent.; a variation nearly as great as found by Mr. Wells.

If the figures, as obtained by the different analysts, are averaged for the various compounds actually contained in cincho-quinine, and the ammonium sulphate be entirely omitted, a preparation closely resembling the *average* composition of the article in question, may be obtained by intimately mixing

Quinia, alkaloid,	5 grains,	or	Quinia sulphate,	7·5 grains
Quinidia, alkaloid,	15 grains,		Quinidia sulphate,	20· grains
Cinchonidia, alkaloid,	10 grains,		Cinchonidia sulphate,	12.5 grains
Cinchonia, alkaloid,	770 grains,		Cinchonia sulphate,	180· grains
Cinchonia sulphate,	200 grains,		Cinchonia, alkaloid,	780· grains
	1,000 grs.			1,000 grs.

Those who desire a still closer representation, may incorporate with either of the above mixtures 54 grains of ammonium sulphate, which will not enhance the cost, but increase the weight of this, as some medical journals tell us, *valuable* nostrum.

COMPARATIVE ANALYSIS OF CERTAIN FLUID EXTRACTS BY IODO-HYDRARGYRATE OF POTASSIUM.

BY HENRY C. SCHRANCK, PH.G.

(*From an Inaugural Essay, presented to the New York College of Pharmacy.*)

The writer of this essay selected the fluid extracts of nux vomica, stramonium, belladonna, conium, hyoscyamus and veratrum viride as those most suitable for his purposes, and in each case obtained original packages from the several manufacturers for the purposes of examination.

The test solutions used were as recommended by Prof. Dragendorff and Prof. F. F. Mayer, and in every case were tested, with great care, with the pure alkaloids or alkaloidal salts. The test solution which was adopted by the essayist was that of the 1-10 normal solution as suggested by Prof. Mayer, but for convenience he calls it in his essay "normal," while that which he calls 1-10 normal is really equivalent to 1-100 normal, as used by Prof. Mayer. The detailed experiments are very elaborate; in the following a brief abstract of the manipulations is given:

50 cc. of the fluid extract of *nux vomica* were evaporated to a syrupy consistence, acidulated with sulphuric acid, and while warm mixed with 50 cc. of water, then filtered to separate fatty matter and diluted to 100 cc. On testing this solution, it was observed that the final reaction with iodohydrargyrate of potassium was not sharply defined; accordingly, the fluid extract was treated as before, the solution somewhat concentrated and potassa added; after 24 hours the crystals of brucia and strychnia were collected and separated by repeated washings with warm water. On concentrating the mother lye, a further crop of crystals was obtained, the remaining alkaloids being obtained by concentrating the mother liquor, treating with sulphuric acid, filtering from resin, and again precipitating by potassa. The small amount of alkaloids, mainly strychnia, remaining in the mother waters was separately estimated by the test solution.

The fluid extract of *stramonium leaves* was acidulated, carefully evaporated, mixed with water, filtered from resinous matter, and diluted to double the original measure. The solution being too dark for correct observations, the fluid extract was precipitated by plumbic acetate, the precipitate well washed, the filtrate freed from lead by hydrogen sulphide, and the filtrate evaporated to three times the original bulk.

Another method gave the same quantitative results. The alcohol was evaporated from the fluid extract, potassa was added, and the liquid repeatedly agitated with fresh portions of chloroform; the chloroformic solution was evaporated in contact with acidulated water and filtered.

The same processes were used for the fluid extracts of *belladonna root*, *belladonna leaves* and *hyoscyamus*.

For testing the fluid extract of *conium fruit* it was found necessary to first separate resin and oil, by acidulating, evaporating, diluting with water and filtering. The filtrate was now concentrated, and the conia

removed by repeated agitation with fresh portions of ether. In one case, treatment like the extract of stramonium was found necessary in order to obtain a liquid free from turbidity.

Fluid extract of *veratrum viride* was acidulated,[1] evaporated to a syrupy consistence, diluted with water, and filtered.

This table shows the number of cc. of the test solution used to precipitate the alkaloids from 100 cc. of the various fluid extracts, the percentage amount of alkaloids in each sample, and the specific gravity of the several fluid extracts examined:

	Nux Vomica.				Stramonium.			Belladonna.		
	CC.	Strychnia.	Brucia.	Sp. Gr.	CC. used.	Atropia.	Sp. Gr.	CC. used.	Atropia.	Sp. Gr.
E. R. Squibb, M.D	96	0·7	1·0	0·855	10·8 (seed)	0·19	0·856	12·8	0 22	1·010
Lazell, Marsh & Gardiner	80	0·56	0·9	0·968	3·0 (leaf)	0·05	1·055	20·8 (root) 13·6 (leaf)	0·37 0·24	0·953 1·023
McKesson & Robbins	90	0·6	0·97	1 000	2·4 (leaf)	0·04	1·060	12·0	0.21	1·091
Henry Thayer & Co	50	0·38	0·52	0·857	7·2 (seed)	0·12	1 029	11·2	0·2	1·082
Tilden & Co	.....	.....	.....	.....	8 4 (seed)	0·15	1 006	16·0 (root)	0·28	0·983
Hance Bros. & White	76·8	0·58	0·82	0·894	3·6 (leaf)	0·06	1·041	12·8	0·22	1·057
Burroughs Manufacturing Co	.....	.....	.....	.....	6·4 (leaf)	0·11	0·951	.....	.....	.....

	Conium.			Hyoscyamus.			Veratrum viride.		
	CC. used.	Conia.	Sp. Gr.	CC. used.	Hyoscyama.	Sp. Gr.	CC. used.	Alkaloids.	Sp. Gr.
E. R. Squibb, M.D	19·2	0·8	1·030	8·0	0·05	1·018	30·0	0·8	0·925
Lazell, Marsh & Gardiner	15·2	0·64	1 050	7·2	0·05	1·054	20·0	0·5	0·977
McKesson & Robbins	.....	.....	.....	6·0	0·04	1·070	20·0	0·5	0·965
Henry Thayer & Co	8·0	0·3	1·057	4·8	0.03	1·082	12·0	0·3	1·020
Tilden & Co	12·0	0·5	0·997	4·2	0·02	0·976	12·8	0·34	0·883
Hance Bros. & White	5·3 (leaf)	0·2	1·086	5·6	0·03	1·020	18·4	0 49	0·942
Burroughs Manufacturing Company	.....	.....	.....	4·8	0·03	0·980	20·0	0·5	0·908

[1] Jervia is precipitated from its aqueous solutions by free mineral acids.—EDITOR AMER. JOUR. PHAR.

THE CULTURE OF TOBACCO IN OHIO.

BY BENJAMIN T. CREIGHTON, PH.G.

(*From an Inaugural Essay.*)

The culture of tobacco, in Ohio, differs somewhat from the description given in the United States Dispensatory, this latter applying to the mode of cultivating the plant in Virginia. A large amount of the finest tobacco found in our eastern market is from the fields of Ohio, hence some knowledge of its growth may be deemed interesting.

The eastern and southeastern part of the State affords the best soil for tobacco growing, and in these districts this product has become a staple article, affording the main crop of the farmer, and, as a rule, rarely failing pecuniarily, for even in seasons when the yield is small, the price of the article is proportionately large.

In growing this much-used vegetable, the first step is the preparing of the ground for sowing the seed, by burning logs of wood or brush on the section of land chosen for tobacco beds. This is done to warm the soil, as well as to supply the ashes needed in nourishing the young plants. The burning takes place either in the fall or spring previous to sowing. If in the fall, the ground is slightly reburnt in the following spring. The time required for burning the beds, if logs of wood are used, is generally from two to three days. If brush be used, a much less time. The earth is then dug up and raked to a proper consistency. After the seeds have been deposited, the bed is thoroughly tramped or walked over, in order that it may retain sufficient moisture. In about three weeks the young plant makes its appearance, but it remains quite small for a considerable length of time, and, in fact, the growth is scarcely noticeable from the time of its appearance above ground (about the first of April,) until shortly before transplanting, which is generally about the latter part of June. It then grows with astonishing rapidity, as, when transplanted, it may have been but from 1 to 2 inches in height, when ready to collect (latter part of August) it generally measures from 3 to 6 feet, and not unfrequently 10 feet in height. The transplanting of tobacco is not unfrequently attended with much difficulty, dry weather being very detrimental to the plant, and too much moisture equally as injurious. In the former case, the young plants wilt and die, and in the latter instance, the earth becomes hardened and baked around the roots of

the vegetable, thus killing it. The ground is considered to be of the proper consistency for transplanting after it has been thoroughly moistened by rain.

Tobacco is collected from the last of August until the last of October, until frost, and, if planted late, this unwelcome visitor often finds a large crop not matured, and which is, consequently, worthless after the first touch of its icy breath. In collecting tobacco the first leaves gathered are called "bottom leaves," being from five to seven of the lower leaves of the plant, after which the plant is *topped*, thus producing larger leaves, and causing maturity in a much quicker time. This topping process strengthens the plant materially, as, after its performance, new shoots or branches will almost always spring from the axils of the leaves nearest to where the tops were broken off, and often afford leaves large enough to be gathered. The next in order are the middle leaves, which are collected in about two weeks after taking the bottom leaves; they consist of from ten to twelve leaves from the central part of the plant, and are the largest as well as the most valuable ones of the plant. Finally, the top leaves are collected, in from three to four weeks after taking the middle ones, providing there is no frost to injure them. These are smaller than the middle leaves, and resemble very much those taken from the bottom part of the plant, but are much cleaner than these latter, which often become very much soiled from their close proximity to the soil.

Among other points in cultivating tobacco, we mention the worming process, which, to most persons, is an exceedingly unpleasant task. The worm which is found on the plant is not very attractive in appearance, nor agreeable to handle. It is of a green color, and, when full size, measures about an inch in circumference and from two to three inches in length. They are very destructive, a single worm often consuming an entire plant in a few days, if unmolested. They are also found to be quite numerous, inasmuch as the tobacco has to be thoroughly cleaned of them several times during a season. To kill them, the worm is grasped with the thumb and finger by the head, and thrown, with considerable force, on the ground, which has the effect of mashing them; when agitated, while taking them from the plant, they will often eject a greenish liquid from the mouth, which is very offensive to the sight, and reminds one somewhat of the tobacco chewers of a higher order.

After collecting the tobacco, it is taken to the tobacco house, and strung upon sticks (by means of a large needle and twine), called "tobacco sticks." Women are employed for this work, who string from one hundred to one hundred and twenty-five sticks per day. It is then placed on the tobacco scaffold, in the open air, until wilted, when it is placed in the "tobacco house," where a gradual heat is applied until it assumes a yellow color. A higher degree of heat is then immediately applied, for twenty-four hours, to "kill it," as the farmer terms it, meaning the expulsion of all moisture from the leaves. The doors of the house are then thrown open, and the floor often sprinkled with water, in order that the leaves may again become sufficiently moistened to permit manipulation. It is now rolled in bundles ready for market.

The main object sought for by tobacco growers is the color, which is influenced by various causes, among the leading ones are the modes of drying and the soil upon which it was raised, as the first crop of tobacco on any soil is invariably the finest. The "yellow spangle" is considered the finest color, and, consequently, brings the highest price. The "light red" also stands high in the list, and is deemed a valuable color. There are several other colors beside the two named which go to make up the tobacco seen in commerce.

Ashes.—After careful experiments with an extra fine quality of tobacco, furnished by an Ohio grower, the following results have been obtained, being the relative per cent. yielded by bottom, middle and top leaves:

Bottom leaves 18·4, middle leaves 14·2, top leaves 14·8 per cent.

In obtaining these results, the tobacco was dried by means of heat until it ceased to lose weight, one thousand grains were then weighed out and subjected to smothered combustion, until charred, after which they were completely incinerated, and the product again weighed, yielding, respectively, 184, 142 and 148 grains of ashes.

These amounts are much smaller than obtained by other experimentors, and I can only attribute the different results to the following, namely: The bottom leaves of tobacco invariably grow on or near the ground, and, tobacco being of a very glutinous nature, become strongly impregnated with the soil. This foreign matter adheres so tenaciously to the leaves that it cannot all be removed, nor can it be recognized with the naked eye. In view of this fact, it is but fair to

suppose that the large amount of ashes which some have obtained may have been due, in part, at least, to the bottom leaves having been used in their experiments.

TOBACCO CULTURE IN PENNSYLVANIA.

BY JOHN ALFRED WITMER, PH.G.

(*Abstract from an Inaugural Essay.*)

The cultivation of tobacco was not carried on to any great extent in Pennsylvania previous to the late civil war; since that time it has increased very considerably. The author's personal acquaintance with the culture of this commodity is limited to Lancaster county, Pa.

The seeds which have been collected the previous autumn are sown (in early spring) in cold frames. These frames consist of large oblong boxes, without bottoms, two or two and a half feet deep by three feet wide, and covered with glass. They are prepared in autumn by being filled with rich earth and fertilizers. In selecting a site for these frames, a sheltered spot having a southern exposure is preferred. They are additionally protected from the weather by being covered with straw, &c. Persons making "plant-raising" a specialty, sow as early as the 15th of February. After sowing, the frames are covered with glass alone during the day, and sheltered at night. The earth being kept moist, the seeds soon sprout, and the little plants appear. Additional care must now be taken to admit the sun during the day and to protect from the frosts at night. Persons not desirous of having plants early or for sale do not take the precautions above enumerated, nor do they sow as early. A warm, sunny spot, having a rich soil, or one enriched by fertilizers, is sufficient for their purposes. When quite young, the plants are frequently infested by the "plant-louse," an insect belonging to the genus "Aphis." When the plants have attained the height of several inches, they are transplanted to the fields. This is rarely done before the 15th of May to the 1st of June. The fields are plowed the previous autumn, as by so doing it is thought that some of the insect enemies are destroyed. In the spring the soil is loosened, and then plowed in such a manner as to form ridges one-half to one foot high, at a distance of four to five feet apart. The plants are planted on the tops of these ridges, at a distance of two to three feet. A wet day is chosen, as the plants require much moisture to continue

their growth without interruption, for at best a large percentage die, owing to want of sufficient care in planting or the ravages of the "cutworm" (different species of the genera Agrotis, Gortyna, &c.), which is the principal enemy at this period of its growth. They are concealed in the earth during the day, and go on their errands of destruction at night, cutting off the plant while it is young and succulent. The only means of preventing the ravages of this enemy is to seek for him in his hiding-place, and when found kill him. These belong to the order Lepidoptera, or scale-winged insects.

After the plants have been thoroughly rooted, one of the principal objects is to keep down the weeds, which grow luxuriantly in the rich soil. This is accomplished by hoe-harrowing and the hand hoe until the plant grows too large to admit the passage of a horse and harrow without injury to the leaves, after which the plant is strong enough to suppress the weeds, when it grows very rapidly, soon attains the height of three or four feet, and puts forth the flowering head. This is broken off when leaves are the object of the cultivator, but when seeds are desired, the inflorescence is left to develop. Cultivators differ as to the proper time to *top* or break off the flower-head; some prefer to top when the stem has six or eight leaves, while others think ten not too many. After being topped, axillary branches are put forth, which are popularly known as "suckers." These are broken off as soon and as often as they appear. The whole plant is now covered by a viscid, resinous substance, commonly called "gum," which renders it very unpleasant to handle.

About this time tobacco's greatest enemy makes its appearance, namely, the "tobacco-worm" (*Sphinx Carolina*, Linn., different species of genus Macrosilla and others). This, the larva of the "grey American hawk moth," is a green worm, sometimes as large as a man's finger. Allied to this is the *Sphinx quinquemaculata*, of Stevens (also referred to Macrosilla), the larva of which sometimes infests tobacco, but more frequently the tomato and potato. These moths hide themselves and sleep during the day, and at night they go forth to deposit their eggs, in patches of six or more, on the leaves. During the early hours of summer evenings they may be seen hovering over the flowers of the "Jamestown weed" (*Datura stramonium*), from which they extract the exuding juice. By the introduction of some virulent poison into these flowers, numbers of them might be destroyed. These,

also, belong to the order Lepidoptera. The larvæ are very destructive to the leaves, and I have known instances in which one worm has eaten an entire plant in a single night. They are watched very closely, picked off by hand, and destroyed.

Of late years a very destructive enemy, in different species of "Arma" (*Arma modesta*, *macula*, &c.), has been noticed. These belong to the order Hemiptera, or half-winged insects, and deposit their eggs in patches of thirty to fifty. When the young are hatched, they puncture the leaves, and suck the juices of the plant. When a leaf has been punctured by these insects, it rapidly withers, and presents the appearance of having been scalded. As yet no practical method has been adopted for the destruction of this enemy.

When tobacco is *ripe*, or fit to cut, it assumes a peculiar yellowish-green color, and when the under side of the leaf is bent it is brittle, and breaks easily. When in proper condition to be gathered, it is cut off close to the ground, and hung up to dry. Various methods have been proposed for hanging it up, but the most approved, and the one generally adopted, is to pierce the base of the stem by a steel spear, in which is fitted an ordinary plastering lath. By this means five or six stalks are slipped on one lath, and handled and hung up as easily as one. The largest growers have sheds built purposely for drying and curing. These are closed in by alternate boards hung on hinges, so that they may be opened for the free circulation of air on favorable days. Tobacco, when dried and cured, is of a brownish-yellow color, very crisp and brittle, and easily broken when handled, but when moistened it becomes quite pliable.

After the 1st of December the tobacco is "stripped." By this is meant the separation of the leaves from the stems. They are then assorted into two grades, viz., "fillers" and "wrappers." The former consists of "ground" leaves, and those which have been torn or worm-eaten; the latter, wholly of fine, perfect leaves. These names are derived from the relative positions the grades take in cigars. The different grades are then bound into small bundles, by wrapping one leaf around the bases of a dozen others. After being pressed in cases it is ready for market. The term "stripping," as applied by the cultivator, should not be confounded with the same term used by the manufacturer, which refers to the separation of the midrib from the leaf.

ANALYSIS OF SPIRITUS ÆTHERIS NITROSI.

BY GEORGE W. KENNEDY, PH.G.

Within the last decade, or since I first began to take an interest in pharmacy, numerous complaints have been made by pharmacists as to the quality of spirit of nitrous ether, as furnished by manufacturing chemists, and also that which is found in the market, and represented to be made by reliable manufacturers. Some of the many complaints are that the preparation is deficient in nitrous ether, and that it contains too much water, besides acetic and nitrogen acids, aldehyd and ethyl chloride. My first attempt towards examining commercial spirit of nitre was made about a year or two ago, after having purchased a small quantity from a wholesale drug house in New York city, which I considered enjoyed an excellent reputation, and from which I thought pure and unadulterated preparations could be obtained. My attention was directed to the color and odor of the article; it was almost colorless, and comparatively destitute of the nitrous ether odor characteristic of the preparation. Pure nitrous ether is of a decidedly yellow color, and, as spirit of nitre contains between four and five per cent. of it, the officinal spirit must necessarily have a yellowish color. Although exposure to light would soon make it colorless, I am under the impression such was not the case with the preparation just alluded to, as, upon examination, it was found to contain but 1·8 per cent. of ordinary ethyl nitrite, and its specific gravity was but 0·920, indicating a large addition of water. The writer would here take the liberty to suggest to the readers of the "Journal" that it is absolutely necessary that some change should be made in the preservation of this highly important and valuable preparation. Those pharmacists who manufacture it themselves, I take for granted, know why it should be excluded from light and air, and kept only in small bottles.

The blame cannot and should not always be placed on the manufacturing chemists, of putting a worthless article of this kind in the market, as, by the writer's analysis of some of the more prominent brands, it will be observed that one of them was in excellent state of preservation, while some of the others bear a good examination, and are thus out of the reach of critics. That obtained from retail sources, and procured from pharmacists living in my vicinity, was, in the majority of cases, entirely unfit for use, and should not be dispensed as a medicine. This would seem to reflect on the probity of some of our wholesale and retail dealers where the sophistication was made. Which

of the two would be guilty of such an ignominious transaction I am not prepared to say, as all the nitre that I examined was obtained from retail druggists, with the exception of those marked otherwise.

It is greatly to be regretted by all those interested in the promotion of the science of pharmacy that so many incompetent or unskilled persons are allowed to practice it. By way of exemplification, I desire to give the readers some idea of a class of druggists that the pharmacists in this country have to contend with. In conversation with a druggist on the above subject, he laughed at the idea of a pharmacist offering for sale spirit of nitrous ether. "Why," said he, "I sell the pure nitrous ether itself, and it is the only thing that should be sold when spt. nit. æth. is called for." A friend of mine, representing a wholesale drug house, from Philadelphia, informs me that he called on a druggist for the purpose of selling him a bill of goods. It was about the time the new "Pharmacopœia" was published. He asked the druggist if he did not want one. The druggist wanted to know what it was; thought it was some new medicine or quack nostrum, and refused purchasing for those reasons. When informed that it was a book of great value to druggsits, and that it should be in possession of every one, his reply was that he could get along without so many books.

I must not get off my subject; but I simply referred to this class of druggists to show the necessity of reform, and of having none but qualified and competent pharmacists. I am satisfied, if we had a more intelligent body of pharmacists, spirit of nitrous ether could be obtained of a far superior quality, as considerable of it spoils owing to the insecure condition in which it is kept; and of course the same will apply to almost any other drug. I know of a retail druggist who buys spirit of nitre by the carboy, and, not knowing the injurious and destructive influence of atmospheric air and moisture, takes no pains to see that the carboy is securely stoppered, but simply drops the stopper loosely into the neck of the carboy, and allows it so to remain. In justice to the pharmacist, and more especially to the patient and physician, manufacturers should not fill it in carboys, but in half-pound or pound bottles, similar in style to that in which Dr. Squibb puts it up. From my investigations I would come to the conclusion that it would be advisable for pharmacists to make their own nitre; prepare it in small quantities, as wanted, and see that it is well preserved. Recently, I have been making all I needed, and find it economical as well as a

pleasure, with the satisfaction, in addition, to know that it thoroughly represents the article required by the "Pharmacopœia." The officinal process is simple, the directions explicit, and the expense but trifling in purchasing a Liebig's condenser, a retort and thermometer—all the apparatus required.

Table giving the Results.

	Made by or obtained from.	Specific Gravity.	Per cent. of Ethyl Nitrite.	When treated with Sodium Bicarbonate.	When treated with Solution of Potassa for Aldehyd.	Nitrogen Acids as shown by Paper previously immersed in Tinct. Guaiac.	Nitrogen Acids as shown when treated with Sulph. of Iron and Sulph. Acid.	Ethyl Chloride treated with Nitric Acid & Nitrate of Silver.	Action on Litmus Paper.	Color.
1	E. R. Squibb.....	0·838	4·6	No effervescence perceptible	No deposit, light red solution	Faint blue color produced	No change noticeable	None	Light red	Pale yellow
2	Powers & Weightman.....	0·840	4·1	Slight effervescence produced	No deposit, red solution	A decided blue color	Light olive	A trace	Red	"
3	Rosengarten & Sons	0·839	4·2	"	"	"	"	"	"	"
4	Retail store.....	0·902	3·2	Effervescence quite active	Heavy deposit, dark red solution	Dark blue color	Dark olive color	Light deposit	Active	Almost colorless
5	"	0·850	3·5	Effervesces slowly	Light deposit, red solution	"	Pale olive color	A trace	"	Light yellow
6	"	0·910	3·1	Effervesces briskly	"	"	Dark olive color	"	"	Very " "
7	Made in New York, sold in town.....	0·907	2·9	"	Heavy deposit, dark solution	"	"	.....	"	Almost colorless
8	Retail store	0·860	3·9	Very slight effervescence perceptible.	No deposit, light solution	Blue color	Light olive color	A trace	Light red	Pale yellow
9	"	0·841	4·0	"	"	"	"	.....	"	" "
10	Freshly made by the writer.....	0·835	4·5	No effervescnce	No deposit, light red solution	Light blue color	No change	.....	"	" "

The last examined was prepared by the writer, and was examined shortly after it was made.

Pottsville, Pa., May 2d, 1876.

EXTRACT OF JALAP.

BY G. H. CHARLES KLIE.

The formula of the "U. S. Pharmacopœia" for the preparation of the extract of jalap is:

Take of Jalap, in moderately fine powder, 12 Troyounces,
Alcohol, ... 4 pints,
Water, a sufficient quantity.

Introduce the powder, previously mixed with 3 fluidounces of alcohol into a conical percolator, and gradually pour upon it the remainder of the alcohol. When the liquid ceases to pass, pour sufficient water upon the residue to keep its surface covered, until 4 pints of tincture have passed. Set this portion aside, and continue the percolation until 6 pints of infusion have been obtained. Distill off the alcohol from the tincture, and evaporate the infusion until the liquids respectively have been brought to the consistence of thin honey; then mix them, and evaporate them to the proper consistence.

The expression, "*introduce into a percolator*," is rather indefinite. It leaves the operator to guess whether to use light, heavy or no pressure at all. I find, that in the first part of the process, where the jalap is exhausted with alcohol, no matter how firm it is packed, the alcohol will pass freely, and without difficulty. The trouble commences when the water is poured on. According to how the powder was pressed in the percolator, the water will penetrate; if firmly, very slow; and when it has penetrated two-thirds, which takes about ten days, it is so overcharged with extract that it will not advance perceptibly. When the powder is loosely packed, the water penetrates somewhat faster; but, when two-thirds of the mass is penetrated, the same difficulty occurs. The line between the alcoholic tincture and water is well defined—the latter in its descent becoming charged with extract, assumes a dark-brown, almost black color. If the apparatus is now left to itself, it may stand months, and still percolation will not be finished. To accelerate the process, I found the following to be about the best method: I poured water on the powder until it stood above the latter five inches, and then, at intervals, stirred the mass down to the line of separation. The stirring re-incorporates the thick, viscid, dark-colored line of separation, and gives the thinned liquid a better chance to penetrate. By this mode the alcoholic tincture was driven out in a comparatively short time. The tincture measured 3 pints and 14 fluid-

ounces, showing a loss of 2 fluidounces. The process was conducted in a common ½ gal. glass percolator, without air-tight lid. The orifice of the percolator was then closed, the mass well stired, and poured on a star filter. Gradually pouring water on the filter, after twelve hours, 4 pints of infusion had been obtained, and the jalap was almost exhausted, at least so much so, that the additional extract to be gained would not compensate further percolation and cost of subsequent evaporation. After concentration and evaporation to the proper consistence, the product was found to weigh 6½ ounces—being 54 per cent. of the jalap employed.

To see whether percolation by water would proceed more favorably with coarse powder, since moderately fine powder, as seen above, whether firmly or loosely packed, or only loosely placed in the percolator, when left undisturbed would not let the water pass; I took one pound of jalap root, ground so as to pass through a sieve of sixteen meshes to the linear inch, moistened it with 4 fluidounces of alcohol, and packed it very tight in an air-tight glass percolator, and poured on alcohol gradually, until 4 pints had been used. From the use of this quantity of alcohol the jalap seemed to be exhausted; water was then poured on, and it took about an hour to displace the remaining alcoholic tincture. The tincture measured 3 pints, 15½ fluidounces, showing that only ½ fluidounce of alcohol had been lost. The dark line between the alcoholic tincture and the water could not be well discerned until the latter had penetrated very near to the bottom. As already mentioned, it took an hour for the water to penetrate the jalap. Dropping was at first slow—the infusion being thick like honey—but, by-and-by, it got thinned, and the drows fell faster. When 2 pints of infusion had been obtained, percolation ceased altogether,—the powder in the percolator having in the mean time swollen to two and a half times its original bulk, and would not let any more water pass. The respective liquids were evaporated, mixed, brought to the proper consistence, and the product was found to weigh 7 ounces, or 43·75 per cent. of the root employed.

There is another method for preparing the extract, obviating the drying and the very disagreeable work of powdering the root. It is: To place the whole root in a vessel with a perforated bottom, and to suspend it in a vessel of water in such a manner that all of the root will be immersed in it. The heavy infusion will sink to the bottom,

and, after some time, all of the water will be saturated, whereupon, the root must be suspended in a fresh quantity of menstruum, and this repeated until it is exhausted. Now the root is superficially dried, pounded into a fine mass, packed moderately firm in a percolator, and displaced with alcohol. For one pound of root 4 pints of alcohol will be found amply sufficient. When percolation ceases, the alcoholic tincture remaining in the mass is displaced by water, which only takes a short time. The yield by this process was found to be 9 ounces of extract from one pound of root, or 56 per cent.

Passing the three different methods in review, the conclusion is arrived at, that, although the product by the first process is satisfactory in amount, still the last mentioned is superior on account of the greatest yield of extract, and the least difficulty in handling the ingredients.

There is one fact in regard to extract of jalap to which I wish to draw particular attention, viz.: the great difference in the price between it and the root. The former is quoted at from $4.50 to $5.00, and the latter can be bought for $0.30 a pound. If it is taken into consideration, that from two pounds of the root one pound of extract is easily obtained—the disproportion in price is at once apparent. The following accounts will explain this more minutely: In account No. 1, 7 pints of alcohol is regained by distillation; in No. 2, all the alcohol is lost by evaporation.

No. I.		No. II.	
Wholesale price of one pound of extract,	$4.50	Wholesale price of one pound of extract,	$4.50
Cost of Material.		*Cost of Material.*	
2 lbs. Jalap root, @ $0.30,	$0.60	2 lbs. Jalap root, @ $0.30,	$0.60
1 pt. lost alcohol, @ $2.30,	0.28¾	1 gal. alcohol,	2.30
Fire,	.15	Fire cost of	.15
Total,	$1.03¾	Total,	$3.05
Difference,	$3.46¼	Leaves difference,	$1.45

The above shows that when the alcohol is regained by distillation, one pound of extract can be made for $1.03¾, and, when it is lost, for $3,05, leaving in the former case $3.40¼, and in the latter $1.45 net profit, as compared with the wholesale price.

Lowell, N. St. Louis, Mo.

REMARKS ON EXTRACT OF JALAP.

BY JOHN M. MAISCH.

The preceding valuable and practical paper, by Mr. Klie, suggests some remarks on the necessity of modifying the officinal process on the occasion of the next revision of the "Pharmacopœia."

Pereira, in commenting upon the process of the former "London Pharmacopœia," after which that of the "U. S. Pharmacopœia" was modeled, states: "It was, formerly, and, indeed, is now, by many persons, supposed that the combination of these ingredients (*i. e.*, the resin and gummy extractive,) was necessary for the full cathartic effect of jalap. It is, however, well known that the watery extract is inert as a purgative, though it is said to be diuretic; the only advantage, therefore, that can attend the mixture of the two extracts (the watery and the alcoholic) is that the resin is intimately divided, and thereby prevented from causing violent irritation and griping in any one part of the intestinal tube. But it is obvious that the same advantage can be obtained by mixing the resin with some mild agent (as almonds, sugar or saline matter)."

In 1864, Mr. Alfred B. Taylor reported to the American Pharmaceutical Association the result of some experiments (see "Am. Jour. Phar.," 1865, p. 219), according to which the aqueous extract, obtained from jalap, previously exhausted by alcohol, is without any laxative or diuretic effect.

Most of the Pharmacopœias of continental Europe have long since (some for more than fifty years) discarded the *extract* and introduced in its place the *resin* of jalap. The few Pharmacopœias in which an extract of jalap is still officinal, prepare it (we believe with the sole exception of the U. S. and British Pharmacopœias) similar to the French codex, by exhausting the powdered root with alcohol, and evaporating the tincture. Thus prepared, the extract of jalap is *nearly* identical with the resin, or rather it consists of resin with a comparatively small quantity of matter soluble in water, amounting, in all, to perhaps ten per cent. of its weight. In this portion will be found, besides some sugar, a body having some resemblance to resin, but differing from this class of bodies by being soluble in water. It is not unlikely that to this principle must be ascribed the mild purgative and diuretic properties, which, according to some old works on Materia Medica, are ascribed to the aqueous extract.

Some eight or ten years ago the writer, while preparing a larger quantity of the resin, by the officinal process, saved the washings, and, by evaporation, obtained an extract, which was employed by several physicians, and found to possess some advantage as a mild laxative, more particularly applicable for children and feeble adults. Whether these properties are of sufficient importance to warrant retaining as officinal, an extract *and* resin of jalap, remains to be determined by further investigations, to which we would herewith direct the attention of the readers of the "Journal." But the point appears to be well settled that the gummy extract obtained from jalap, by water, after previous exhaustion by alcohol, is destitute of medicinal properties, and should be omitted in the next revision of the "Pharmacopœia."

("*This prescription must not be renewed.*")

A SUGGESTION TO PHYSICIANS.

BY HANS M. WILDER.

The above words (or something of similar import) are familiar to every dispenser, and are to be found printed on nearly every kind of prescription blanks. I would respectfully suggest that said words be *written* every time when found necessary, in order to save the dispenser a great deal of trouble.

The trouble comes in this way: Suppose a physician prescribes a very active preparation (and perhaps in an unusual dose) which he does not wish to be renewed; he relies on the *printed* formula and on the dispenser's common sense.

Suppose, further, that said medicine has done the patient a great deal of good, and he wants it made over again, he comes again himself or sends somebody to the drug-store. There now ensues a conversation somewhat in the following fashion:

The dispenser expresses his regret that he cannot comply with the wish of the patient; but the physician does not want it done.

"How do you know?"

"Why, you see here, this prescription must not be renewed."

"Well, but that means nothing, I am sure. You see it is *printed*, and will, of course, apply to everything written on the prescription paper. Suppose the doctor had prescribed sweet spirits of nitre, for instance, you could surely not refuse to renew that."

The dispenser admits this point, but still refuses to renew the prescription, and tries everything to convince the customer that he is bound not to do it. All the thanks he gets for his pains are something like the following:

"I must tell you, sir, that you are a very disobliging man. I shall *never* come to you again!" Exit.

If, now, the physician had *written* said words, the customer would have been able to understand that the dispenser did but his duty when he refused to renew the medicine.

A WAFER MACHINE AND PRESS.

BY WILLIAM McINTYRE, PH.G.

(*Read at the Pharmaceutical Meeting held May 23d.*)

Numerous writers have advocated the advantages of wafer capsules, and while doing this, have condemned those of American manufacture; the objection urged is their appearance, it being not denied that they are quite as suitable for the intended purpose as the imported article.

The apparatus exhibited herewith presents in a compact form all that is required to manufacture from wafer sheets, concave wafer discs and a press to seal them for use. It consists of two metallic dies of the same size, one of which has one of its faces turned to the proper concave form; the other has a corresponding convex face, and on the opposite side a hole is bored to allow of the insertion of a wooden handle. These dies are moderately heated, a flat wafer disc is inserted and pressure applied for a moment, when upon separation of the dies, the disc will be found to have the desired shape.

The flat discs are cut from sheet wafers by a punch similar to a cork borer—the other end of which is arranged so as to form the wetter.

The addition of a duplicate concave die will furnish the press, and complete the apparatus.

THE PHARMACEUTICAL VALUE OF SUGAR OF MILK.

BY WALTER E. BIBBY, PH.G.

(*Read at the Pharmaceutical Meeting, held May 23d.*)

At the Pharmaceutical Meeting, held in the College hall on the 21st of March, Mr. J. C. Biddle recommended the incorporation of

sugar of milk with powdered squill, in order to prevent caking. This led me to believe that this substance could be used to attain the same effect in a large number of the gum resins that are often required in the state of powder, and which cannot be reduced unless previously heated, which process is very liable to endanger or completely subvert the therapeutical value; or, if powdered by any other means, it fails to reach the wants of the pharmacist, by reason that the state of powder is merely temporary. Belonging to this class of substances are ammoniac, assafœtida, galbanum, guaiac, myrrh and a large number of others.

Now, to preserve these substances in the state of fine powder, and in a condition that they may be dispensed on the prescriptions of physicians in a thoroughly pharmaceutical manner, I would recommend that sugar of milk be added and triturated in the proportion of either three parts of the gum resin to one of sugar of milk, or of two of the former to one of the latter,—the powder to be preserved in well-stoppered bottles.

For guaiac resin and squill, I use 90 parts to 10 of sugar of milk. It may be well to state, that the cooler the weather the less time is required for trituration. To preserve camphor in a form of powder, I find sugar of milk answers better than any other substance that has been recommended. Below is given the quantity of sugar of milk required:

Take of	camphor,	90 grains.
	alcohol,	30 drops.
	sugar of milk,	10 grains.

Rub the camphor first with the alcohol, until reduced to a fine powder, then with the sugar of milk.

The sample on the table was powdered in this manner, about two months ago.

At the suggestion of Prof. John M. Maisch, I was induced to try sugar of milk in preparing mercurial pill and mercury with chalk, which two preparations are very seldom manufactured by the apothecary, for the reason, of the great difficulty encountered in extinguishing the mercury. In preparing blue pill, I find, to my entire satisfaction, by substituting sugar of milk for powdered liquorice root, and with a slight modification of the officinal process, this difficulty can be readily overcome. I recommend the following process for

Pilula Hydrargyri: Take of mercury,
confection of rose,
sugar of milk, . . . āā ℥i

Rub the mercury with the confection of rose and sugar of milk, until metallic globules are no longer visible.

Blue mass, prepared in this manner, has about the same pilular consistence as when prepared by the formula of the "U. S. Pharmacopœia." The blue pill is often wanted in the state of powder; this has led to quite a number of suggestions. Some have recommended rubbing together mercury with honey, until globules of mercury cease to be visible, and then incorporating other ingredients, the whole to be set aside in a warm place to dry, and then reduced to powder. Others recommend rubbing the mercury with syrup and sugar, and dry by the aid of heat. I may here state that both of these processes are exceedingly objectionable, as when heat is employed or when left in contact with the air, the mercury becomes oxidized, and renders the preparation entirely too active. Also when honey or sugar are employed, the preparation is liable to attract moisture from the atmosphere, which causes it to cake together and become hard.

To remedy this, and at the same time produce a perfect division of the mercury, I would suggest the following method for making

Pulvis Pil: Hydrargyri.—Take of mercury, ℥i
sugar of milk, ℥ii

Triturate the mixture thoroughly until the powder will pass through a fine sieve, or fine bolting cloth.

Prepared in this manner, powdered blue mass is a light-grayish powder, and incapable of attracting moisture; and so thoroughly is the minute state of division, that globules of mercury cannot be seen with the aid of a lens. This preparation is also well suited for conversion into the pilular form.

Mercury with chalk, made according to the formula in the "U. S. Pharmacopœia," does not come up to the wants of the physician, on account of the imperfect division of the mercury; and, owing to this fact, it has fallen considerable into disuse. After trying various means, none answered so well and was as convenient as sugar of milk. I prepare it in the following manner:

Hydrargrum cum Cretâ: Take of Mercury, . . . ℥iii
Prepared chalk, . . ℥iv
Sugar of milk, . . ℥i

Rub the mercury, prepared chalk and sugar of milk into an impalpable powder, and pass it through a fine sieve.

The above formula, although not containing the same amount of prepared chalk, contains the metallic mercury in the same proportion (3 in 8) as called for in the "U. S. Pharmacopœia," and I think is more efficacious as a remedy, as the mercury is more thoroughly divided.

In the above, I state the result of my manipulations with sugar of milk and those substances that are required to be in a very minute state of division; and I feel confident that those who will employ this substance in the manner and for the purpose I have described, cannot fail to acknowledge that sugar of milk is preferable to all other substances. Being perfectly harmless, of a hard, gritty nature, and chemically a perfectly definite material, I feel certain that it will supercede the old practice of employing heat in powdering the gum resins. Moreover, in dispensing emulsions, sugar of milk materially assists in the formation of a perfect emulsion, by reason of the minute state of division of the gum resin, induced by the trituration of sugar of milk with the drug.

GLEANINGS FROM THE FOREIGN JOURNALS.

BY THE EDITOR.

The Decomposition of White Precipitate by Iodine, Chlorine and Bromine.—V. Schwarzenbach has observed that iodine may be triturated with white precipitate, or heated with it in a crucible, without any other result being observed, especially in the latter case, than the formation of beautiful red crystals of mercuric iodide. But, if alcohol be added to the mixture, in an open vessel, after some time (about 35 minutes) a smart explosion takes place, which inevitably destroys the vessel, if it be of glass, but only to the exact height reached by the surface of the liquid. Up to the time of explosion no rise in temperature was observed, and the inserted thermometer remained uninjured when the vessel was destroyed. In direct sunlight, the explosion followed more rapidly, frequently in 9 or 10 minutes. Among the products, scattered by the explosion, were red mercuric iodide, and strongly detonating particles of nitrogen iodide of considerable size; the gas evolved was identified as nitrogen. If chloroform or amylic alcohol are used, instead of ethylic alcohol, and the iodine is increased to six atoms for two molecules of white precipitate, strong detonations occur in the liquid.

When powdered white precipitate is dropped into an open flask, filled with chlorine, it becomes strongly heated, after a few minutes, and assumes an appearance of ebullition, followed either by an explosion or, more frequently, by the appearance of a greenish flame, free nitrogen, nitrogen chloride and mercuric chloride being formed.

The action of bromine, upon white precipitate, was found to be very analogous to the foregoing.—*Pharm. Jour. and Trans.*, 1876, March 11, from *Ber. D. Chem. Ges.*, vol. viii.

Mr. Charles Rice, having observed detonations occurring while triturating white precipitate with tincture of iodine, reports, in "New Remedies," for February, that the addition of carbolic acid prevents the explosion and generates some iodoform, equal to about two per cent. of the iodine employed. Without alcohol, iodine and white precipitate produce no iodide of nitrogen, nor does a solution of iodine in carbolic acid, without alcohol, produce iodoform. The investigations were instituted on noticing that, while making an ointment composed of Tinct. iodinii ʒss. Hydrarg. ammon. gr.ii, and Ung. acidi carbol. ʒi, a sudden fading of color took place, and the resulting ointment was entirely white.

An assay of persian opium was recently made by W. D. Howard; it had been sent to England as "perfectly pure," and yielded, not previously dried: morphia, crystallized from alcohol, 10·40; codeia (anhydrous), 0·29; narcotina, 2·50; thebaina, 0·57; cryptopia, 0·09 per cent., and a trace of papaverina.—*Pharm. Jour. and Trans.*, 1876, March 11.

Impure Potassium Iodide.—Thos. F. Best has found, in five samples, the following excess of alkali, consisting chiefly of carbonate: 5·44, 5·35, 2·32, 1·78 and 0·53 per cent. Commercially pure iodide should not contain more than from 0·15 to 0·20 per cent.—*Ibid.*

Detection of Free Mineral Acids in Vinegar.—Witz has proposed methylanilin-violet for this purpose. A. Hilger, in experimenting with it, observed that pure vinegar does not affect the color, but on the addition of sulphuric acid the color is changed, with one-fifth per cent. to blue, with one-half per cent. to blue-green, and with one per cent. green. Similar changes occur with muriatic acid, one-tenth per cent. producing a blue, one-fifth per cent. a green color, and with one per cent. the color disappears. Much smaller quantities of free min-

eral acids may, however, be detected by evaporating the vinegar, with some of the violet, to a small bulk.

The color solution was made by dissolving 0·01 grm. methylanilin-violet in 100 grm. of water, and 2 to 3 drops of this solution are used for 25 cc. of vinegar. The method is not applicable for the quantitative determination of the free mineral acids, the change to violet, on neutralizing with alkali, occurring gradually.—*Archiv d. Pharm*, 1876, March, 193–196.

Chloral-Chloroform, which was, several years ago (see "Am. Jour. Pharm," 1870, p. 319 and 409; 1871, p. 410), recommended as being preferable to ordinarily prepared chloroform, on account of its not being decomposed by light, has again been examined by Dr. Schacht, and found to alter in the light as rapidly as the latter, unless preserved by the addition of a little alcohol.—*Pharm. Zeit.*, No. 26.

The quantitative separation of morphia from sugar cannot be effected by the processes recommended for the quantitative estimation of that alkaloid. Dr. Schacht has made numerous experiments on this subject, and is continuing his investigations.—*Ibid.*

Butyl chloral.—Dr. Oscar Liebreich states that Krämer and Pinner have ascertained that the substance commonly called *croton-chloral* contains 2H more than was supposed, and is, in fact, butyl-chloral. Soda decomposes it, forming chloride and formiate of sodium, and bichlorallylene. According to Liebreich, chloral causes death by interfering with the cardiac ganglia; butyl-chloral, by its action on the respiratory centre. With the latter, anæsthesia commences at the head, while reflex action can still be excited on the limbs. Doses of butyl-chloral, sufficient merely to produce anæsthesia of the head, do not essentially affect the pulse and respiration. In insane adults, 5 grams were found to produce sleep and anæsthesia of the head, with maintenance of the muscular tonus, and of reflex action in the trunk, so that the patients remained sitting, while the head was perfectly anæsthetic.

Liebreich orders it in the following form: butyl-chloral hydrate, 5 to 10 parts; glycerin, 20 parts; distilled water, 130 grams; the mixture to be shaken before being used. The dose is half an ounce, to be followed, in five minutes, by a second, and, in ten minutes, by a third. It is well to commence with a small dose, to avoid producing

hypnotism, where the anæsthetic effect alone is desired. To produce sleep, one, two or three grams, according to the patient's constitution, are to be given at bed-time.—*Pharm. Jour. and Trans.*, 1876, February 19.

Myrrh, according to W. Dymock, comes to Bombay from Berbera, where it is purchased by agents residing at Aden or Makulla. The bags or bales, when opened in Bombay, are found to be made up of, 1, a large proportion of roundish masses of fine myrrh; 2, a considerable proportion of small semi-transparent pieces of myrrh, of irregular shape; 3, numerous pieces of dark-colored myrrh, mixed with bark and other refuse; 4, a small proportion of an opaque gum resin (*Bdellium opaque*, of Guibourt?); occasionally small pieces of resin (juniper?) are also met with. The contents are sorted, the best myrrh going to Europe, the darker pieces forming a second quality, and the refuse being exported to China, where it is probably used as incense. True myrrh is known in the local market as kărăm, the opaque bdellium as meena hărma. The latter is used for the extraction of the Guinea worm; it resembles ammoniacum; is yellowish-white and bitter, with hardly any odor.

The Arabian myrrh of the "Pharmacographia" is received from Makulla and Aden, and is known as meetiga; no true myrrh is ever received from Arabia.

Bdellium comes also from Berbera. Besides the ordinary bdellium, the bales contain a small quantity of a perfumed kind, occurring in irregularly shaped pieces, more or less flat, some of them having fragments of thick bark adhering. The color of the gum is dark reddish-brown, but opaque yellowish-white streaks are frequently met with in the semi-transparent mass. The odor, on fresh fracture, is powerful and pleasant, not unlike a lemon lollipop. The Arabic name is hăbăk hādee.

Indian bdellium comes chiefly from Deccan; in form and appearance it resembles the African drug, the pieces often having pieces of a papery bark attached to them; but the color is greenish, and the odor, though similar, is more faint. Its value is one-third less than the African bdellium.—*Pharm. Jour. and Trans.*, 1876, Feb. 19.

Damiana.—The three varieties of Damiana ("Amer. Jour. Pharm.," 1875, p. 518) have been examined, as to their botanical origin, by Mr.

E. M. Holmes. That of Helwick & Co. comes from a plant of the genus *Turnera*, nat. order *Turneraceæ*, allied to *Turnera microphylla*, D. C. The San Francisco damiana appears to be a hairy variety of the same plant, and has a taste recalling that of confection of senna (not sage-like, as stated on page 519 of last volume). The third kind of damiana is the *Aplopappus* (now called *Haplopappus*) *discoideus*, D. C., the leaves of which taste like sage.—*Pharm. Jour. and Trans.*, 1876, Jan. 22.

Dr. J. T. Rothrock, of Wilkesbarre, Pa., published a paper on the last mentioned variety of damiana in the "Phila. Med. and Surg. Reporter," March 4. He arrived at the same conclusion, and gives the following synonyms for the plant: *Linosyris mexicana*, Schlechtendal; *Baccharis veneta*, Humboldt, Bonpland and Kunth, and *Bigelovia veneta*, Gray. It is a common plant in Mexico, and another closely allied species, which by some is considered identical with the preceding *Bigelovia Menziesii*, Gray, is found in California and Arizona. Prof. Gray has confirmed these conclusions.

NOTES ON THE INTERNATIONAL EXPOSITION.

BY THE EDITOR.

The International Exposition in Philadelphia, which was formally opened by the President of the United States on the tenth of May, is the seventh which has taken place during a period of twenty-five years. The first one being inaugurated in London, it was followed by the one in New York in 1853, which, although a failure in more than one respect, nevertheless exerted a powerful influence upon the development of arts and industries in this country, and served likewise to make the United States better known in foreign countries. Paris followed in 1855, London again in 1862, Paris in 1867 and Vienna in 1873. Several international exhibitions of special industries having in the meantime been held in various other European cities, a grand fair of the entire industries of all civilized nations was undertaken in commemoration of the centennial anniversary of the independence of the United States, and Philadelphia, from which place the declaration of independence emanated, was selected as the most fitting place to celebrate the one hundredth anniversary of that historical event.

The ground chosen for the grand gathering is in West Fairmount Park. The park takes its name from that portion of the public grounds where the principal water-works and the oldest of the present reservoirs have been built, which are still known as the Fairmount water-works and basins. From these works the present Park extends in a northerly and westerly direction, on both banks of the Schuylkill river, following afterwards the circuitous bed of Wissahickon creek, comprising, altogether, an area of 2,991 acres, and being divided by the Schuylkill into an east-

ern and western section. In the latter portion, from Girard avenue north, the hills rise suddenly to 116 feet above the Schuylkill, forming the extended Lansdowne Terrace upon which the Exhibition buildings have been erected.

These buildings are, altogether, over 190 in number, a few of which are still unfinished at this date. The largest number of these have been erected for special purposes, special exhibits, and for the accommodation and special interest of the various nations and States represented. Those buildings which are intended to accommodate the arts and industries of all nations are few in numbers, but necessarily very extensive.

The *Main Exhibition Building* forms a parallelogram 1,880 feet in length and 464 in width, and covering upon the ground floor an area of 20·02 acres, or 872,320 square feet. Nearly the whole structure forms one story, with a central height of 70 feet, the sides being 24 feet high. In the projections and towers are upper floors, with an area of nearly 64,000 square feet, or almost 1½ acre.

Machinery Hall is located west of the former, and has a length of 1,402 feet, and a width of 360 feet, with an annex of 208 by 210 feet. It covers a ground space of 558,440 square feet, or 12·82 acres.

Memorial Hall accommodates sculptures, paintings and other products of the fine arts, and has been erected with a view to permanence, no wood having been used in its construction, and every portion of the building being fire-proof. It occupies the most commanding portion of the plateau, and is 365 feet in length by 210 feet in width, and 59 feet in height, over a basement 12 feet high, and surmounted by a dome rising to 150 feet from the ground. It covers an area of 1·5 acre.

The *Horticultural Building*, which covers the same area as Memorial Hall, and, like it, will not be taken down again, is situated north of it, has a length of 383 feet, a width of 193 feet, and an extreme height of 72 feet. It consists of a central conservatory, 230 by 80 feet, and 55 feet high, and has on each of its long sides two forcing-houses, 100 by 30 feet, covered with curved roofs of iron and glass. The heating arrangements, etc., are in the fire-proof basement.

The *Agricultural Building* is still farther north, and consists of a long nave, crossed by three transepts, the central one being 100, each of the two lateral ones 80 feet wide. The nave has a length of 820 and a width of 120 feet; its extreme height, like that of the central transept, is 75 feet, the end transepts being 5 feet less. It covers an area of 10·15 acres.

The buildings mentioned above comprise all the general Exhibition buildings. We have deemed it necessary to give a brief description of the *size* of these structures, so that our readers may form some idea of the immense amount of products on exhibition. Those which are of greatest interest to the pharmacist and druggist will mostly be found in the Main Building, a few in the Agricultural Building, some plants yielding drugs in the Horticultural Building, and those pharmaceutical apparatus which, for successful manipulation, *require steam-power*, in Machinery Hall.

Articles of more or less pharmaceutical interest will, however, also be found in the extensive building erected by the United States Government and in the Women's Pavilion.

The arrangement in the Exhibition halls is national, that is, a certain space has

been allotted to each nation, and within this space the exhibits are arranged so as to show the most important industries to best advantage. To find and examine all that is important or of special interest to pharmacy requires, therefore, a journey of many miles within the Exhibition grounds.

All the goods on exhibition have been placed in twenty-eight classes, the most important of which for us is Class III: "Chemistry and Pharmacy, with the apparatus," for which the following international Jury of Awards has been appointed:

American—Professor C. A. Joy, New York; Professor F. A. Genth, University of Pennsylvania, Philadelphia, Pa.; Professor J. Lawrence Smith, Louisville, Ky.; Professor C. F. Chandler, New York; Professor J. W. Mallet, University of Virginia, Charlottesville, Va. Foreign—Dr. Odling, F.R.S., Great Britain; Dr. R. von Wagner, Germany; M. Kuhlmans (fils), France; Mr. Dewilde, Belgium.

Articles of more or less interest to the drug trade will doubtless be found in some of the other classes.

VARIETIES.

Sassafras as an Antidote to Vegetable Poison.—The Cincinnati "Lancet and Observer" for April, has a paper by Dr. A. W. T. Lyle, of Castleton, Ind., in which attention is called to the statement by Dr Thompson, of Nashville, concerning the antagonistic properties of sassafras to henbane and tobacco. Dr. Lyle mentions the case of a child four years old who had eaten stramonium flowers, and showed symptoms of poisoning. After the administration of emetics, ten drops of oil of sassafras were given every half hour until six doses had been taken, when consciousness returned, and, after taking a dose of castor oil, the child was playing the next day, and free from all pains or disturbances following poisoning.

Hair Tonic.—The "Med. and Surg. Rep." for March 18th, gives the following from Erasmus Wilson's book on skin diseases, under the title of *Lotio capillaria stimulans:* Oil of almonds and strong ammonia water, each 1 oz., spirit of rosemary 4 oz., balm water, 2 oz.

Resolvent Ointment.—According to the "Med. and Surg. Rep.," the following ointment is employed with great success by Dr. Noel Guéneau de Mussy: Camphor one, ammonium chloride four, and lard thirty grams.

Cure eor Corn. Bind raw cotton on your corn at night before going to bed, and then saturate the cotton with oil of turpentine. It will remove the most obstinate corn, either hard or soft, in four or five applications. The skin will be apt to peel off the toe, but this is rather an advantage, as it helps to remove the corn. —Correspondent of *Scient. Amer.*

SOLUTION OF SALICYLIC ACID. Prof. Emlen Painter proposes the following formula, whereby two grains of salicylic acid can be given in a teaspoonful of solution. Dissolve salicylic acid gr. xxxii in liquor. ammon. acet. f℥ii. The solution may be made without heat, is not unpleasant to take, and possesses quite perceptibly the sweetish taste of the acid. Besides, solution of ammonium acetate would be likewise indicated in most cases where salicylic acid would be prescribed for internal uses. Its cumulative action (see "Amer. Jour. Phar." 1876, p. 68), should not be lost sight of.—*Pacif. Med. and Surg. Jour.* 1876, *April.*

THE following notes are taken from the "Leaflets for the Scrap-book," issued by Mr. M. S. Bidwell, of Elmira, N. Y., which were noticed in our December number:

Hints to Prescribers.—Much perplexity might be saved to dispensers, and the danger of error materially lessened, by the observance of the following simple suggestions:

1. If the remedies prescribed are officinal, use the officinal terms; if not officinal, describe them unmistakably. The writer has heard of three different liquids called chloric ether, and has known Tully's Powder to be made of three very different degrees of strength.

2. Do not abbreviate so closely as to cause ambiguity; hyd. chl. may mean calomel, corrosive sublimate, or chloral hydrate.

3. Write the directions for use as they are to be put on the label.

4. Give the patient's name, and mention if a child or infant.

5. After writing the prescription, look it over and see if there is anything, especially in the numerals, that a careless or ignorant druggist might misunderstand.

Solubilities.—The following list gives approximately the number of grains of the salts mentioned, that can be readily dissolved in one ounce of water at the ordinary temperatare. If this limit is much exceeded, a clear solution cannot be expected.

Potassium iodide	500
Ammonium bromide	300
Potassium bromide	240
do bicarbonate	120
do nitrate	100
Sodium borate	40
Potassium chlorate	30
Mercury bichloride	25

It should be remembered that the bulk of the solution exceeds that of the solvent; thus an ounce of water and an ounce of potassium iodide make about an ounce and a half of solution.

Curious Incompatibility.—Chlorate of potassium and iodide of potassium are both entirely harmless in suitable doses. Furthermore, these two salts do not react upon each other in solution, even at a boiling heat. Yet it has been proved that when they are administered together, they do combine in the stomach, producing iodate of potassium, which is poisonous. M. Melsens found that dogs could take the chlorate or iodide in doses of five to seven grams with impunity, but that a mixture of

the two killed them in a few days, with the symptoms of poisoning by iodate of potassium. This combination must therefore be avoided. Indeed, as a general rule, the chlorate is so unstable, and so ready to give up its oxygen, that it cannot safely be combined with any substance capable of oxidation.

Notes on Disinfectants.—Salicylic acid loses its power entirely in an alkaline solution, the salicylates not destroying fermentation germs.

It has been taken internally to the amount of 1·5 grams (23 grs.) daily, without injury. About 3 grs. a day have been given as a prophylactic against diphtheria, with apparent good result.

Carbolate of Lime.—Chemical examination has shown that five out of six samples in the market were nearly worthless, containing hardly any phenol, but owing their smells to various tar oils possessing little or no disinfectant power. An excellent carbolate may easily be made by mixing one part of crude carbolic acid with eight parts of slaked lime.

Chloral hydrate is a powerful antiseptic, and has been used with special success in preserving anatomical specimens.

Beech Wax. By F. A. Flückiger.—On the bark of beech trees there occurs a greyish film, formed by insects, fatty to the touch, and consisting, as shown by the microscope, of fine threads, which are easily broken up. The substance composing it is scarcely acted on by water. It gives up to boiling carbon bisulphide about one-third of its weight of a wax crystallizing in white laminæ, melting at 81°—82°, and having the composition of cerotic acid, $C_{27}H_{54}O_2$. The wax, however, when dissolved in alcohol, does not redden litmus, as does cerotic acid, nor is it attacked by prolonged boiling with aqueous or alcoholic potash.—*Jour. Chem. Soc.* [Lond.], from *Arch. Pharm.* [3], vii, 8.

MINUTES OF THE PHARMACEUTICAL MEETING.

The eighth regular meeting of the session was held May 23d, 1876, Edward Gaillard in the chair. The minutes of the previous meeting were read and approved.

Mr. Edward Lindewald, of Stockholm, Sweden, was introduced and invited to participate in the meeting. Prof. Maisch donated to the cabinet, from Daniel B. Smith, some additional plants for the herbarium, and the press with which they had been pressed. They were accepted with thanks.

The Registrar read a paper by Walter E. Bibby on the Pharmaceutical value of sugar of milk (see page 267). Prof. Maisch had remarked upon a former occasion that the observations made by the writer were of great importance to practical pharmacy and would repeat the statement. The sample of powdered myrrh exhibited, although apparently somewhat agglomerated, when rubbed between the fingers would be found to be in a fine state of division, and to judge from the odor, contains the entire amount of volatile oil. The mercury with chalk, under an ordinary lens, appeared as a powder perfectly uniform in color, and was, to all appearances, free from oxides. The paper suggested numerous applications. Mr. Bibby stated, in answer so a suggestion, that he had made numerous experiments with asa-

fœtida, with variable results, but found that by the addition of an equal amount of sugar of milk a permanent powder could be produced.

The Professor remarked he could well see the cause of the variable results, which must be due to the variable composition of commercial asafœtida, which, according to Prof. Dymock, of Bombay (see "Amer. Jour. Phar." 1875, 320), is generally more or less adulterated.

Prof. Remington thought it advisable to find out the smallest possible amount of sugar of milk required in the case of each drug.

Mr. Bibby thought in preparing emulsions with these powders a mortar should be used, mere agitation in a vial not always yielding good results.

William McIntyre read a paper on a wafer machine and press, (see page 267) illustrating its use in actual practice. All the apparatus necessary for making one size of wafer disks and capsules had cost $3.

Prof. Maisch showed a handkerchief with initials marked thereon eleven months ago, by placing upon it the lower surface of a leaf of *Magnolia glauca* and tracing the letters upon the upper surface with a pointed instrument, using some pressure; he stated that his attention had been called to this property by C. E. Hornberger, a member of the last graduating class. The handkerchief exhibited had been frequently washed, without affecting the marking.

A. P. Brown exhibited an inhaler for gaseous chloride of ammonium, which has been devised by H. P. Reynolds, of Plainfield, N. J., and may be prepared from an ordinary wide-mouth bottle, closed with a tightly fitting perforated cork, so as to admit of two tubes. One of these is a glass syringe tube, passing nearly to the bottom and filled with small pieces of sponge; while the longer, which is bent to be applied to the mouth, may have its origin just below the bottom of the cork. When it is wanted for use, the cork is removed, and after placing three or four drops of chemically pure muriatic acid in the bottle, and the same quantity of strong aqua ammoniæ in the syringe tube containing the sponge, the mouth-piece of the inhaling tube is taken between the lips for the purpose of inhalation. In drawing air through the apparatus, the ammonia combines with the muriatic acid, and the air becomes charged with vapors of ammonium chloride.

Prof. Remington described a convenient way of inhaling substances which are usually added to hot water—a rubber tube is slipped over the small end of a funnel which is placed as a cover over a tin vessel containing the water and drug.

Prof. Maisch exhibited the seeds of *Paullinia sorbilis*, which are used in South America in the preparation of guarana; *Strassburg turpentine*, Terebinthina argentoratensis from Abies pectinata, which is similar in appearance to Canada balsam, and used in Europe for similar purposes; *Dita bark* from Echites scholaris, which has attracted some attention as a febrifuge; the *rind of the fruit* of Garcinia mangostana, recommended as a reliable remedy in dysentery; *Goa powder*, which contains much chrysophanic acid, and is stated to be very useful as an external application in ringworm and other skin diseases; *the fruit* of *Myrcia acris*, resembling allspice, but more oblong in shape, which is used with the leaves of the same plant in the distillation of bay-rum; a white crystalline *saccharine principle*, which has been isolated by Prof. E. S. Wayne, from American bitter-sweet, the bark of Celastru scandens, and the highly-aromatic *volatile oil* of spice-berry, the fruit of Benzoin.

A. P. Brown exhibited aromatic waters of cinnamon, peppermint and spearmint, and Edward C. Jones samples of cinnamon water, made by various processes, and desired information as to how many pharmacists prepared the water from Ceylon cinnamon, and to what extent cassia was used. A. P. Brown having recently given some attention to this subject, thought but few used Ceylon cinnamon.

This being the last regular meeting of the session, and it being the opinion of the members that it would be profitable to still continue them, a motion was adopted to adjourn to meet upon the 20th day of June.

WILLIAM MCINTYRE, *Registrar.*

PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

PHILADELPHIA COLLEGE OF PHARMACY.—Since the close of the examination, in March last, the building has been thoroughly renovated, and a number of permanent and temporary improvements have been added, the latter being more particularly intended for the convenience of the visiting pharmacists from this and foreign countries, who are expected to visit Philadelphia during the next four or five months. Adjoining the laboratory, a one-story brick building has been erected some months ago, with the view of accommodating Prof. Maisch, and furnishing additional conveniences for his labors in connection with the "Journal" and as Secretary of the American Pharmaceutical Association; it is likewise used as an analytical balance room. Amongst the alterations made in the laboratory may be mentioned the removal of the fume-closet to an adjoining building, recently put up. The old cabinet cases have been taken from the meeting room to furnish better accommodations for the private collections of the professors. The cabinet of Materia Medica and Chemistry has been entirely refitted by the curator, Professor Remington, and now presents not only a very attractive appearance, but, what is of greater importance, it contains many interesting and valuable specimens carefully preserved. The general herbarium of the College, the nucleus of which consists of the valuable collection presented, many years ago, by the late Elias Durand, has been classified and partly catalogued; while the herbarium recently presented by Daniel B. Smith ("Amer. Pharm. Jour.," 1875, p. 514), has been arranged in the cases provided for it. The library has been put in thorough order by the librarian, T. S. Wiegand, and now offers ready convenience for consulting it. The alterations in the lecture rooms consist mainly of improvements in the means of ventilation, and additional facilities for illustrating the lectures.

Amongst the transient preparations is to be mentioned the erection of a temporary building, in which the closets and wash-baisins, desirable for the convenience of visitors, have been placed.

The formal opening of the renovated building took place on the evening of May 23, when, in response to the invitation of the hall committee, a large number of members, visiting pharmacists and other guests, with their ladies, assembled in the lower hall, which appeared like a tropical garden, from the numerous plants

judiciously arranged therein. Most of the plants, which were kindly loaned for the occasion from the hot-house of Prof. Geo. B. Wood, represented some officinal articles, such as sago, sugar, coffee, tea, cinnamon, &c. The entrance hall had been handsomely decorated with the flags of the nations represented in the international exposition, a glass tablet, with the following greeting, being suspended from an arch in the centre of the hall:

"COLLEGIUM PHARMACEUTICUM PHILADELPHIENSE ARTI MEDICAMENTARIÆ OPERAM DANTES UBICUMQUE GENTIUM SALUTAT."

In the lower lecture room the company was treated to an exhibition with the College stereopticon, the oxy-hydrogen lamp being, for the evening, in charge of Mr. D. S. Homan, of the Franklin Institute; Dr. J. G. Hunt exhibiting a number of Microscopical preparations; Mr. Charles Bullock following with an exhibition of American and foreign sceneries. The company, afterwards, repaired to the lower hall, where an acceptable collation of ice cream and cakes had been provided, and small bouquets were handed to those present. After further social intercourse, the company dispersed.

Great credit is due to the hall committee (Messrs. C. Bullock, T. S. Wiegand and Wm. Bakes) for the manner in which the improvements were made, and the very satisfactory arrangements for this opening reception.

THE ALUMNI ASSOCIATION OF THE MASSACHUSETTS COLLEGE OF PHARMACY has elected the following officers for the ensuing year: Edward S. Kelly, President; Chas. M. Howe and James S. Whall, Vice-Presidents; S. A. D. Sheppard, Secretary; Jas. C. Lowd, Treasurer, and Wm. W. Bartlett, auditor.

At the annual supper, at the Revere House, on April 21, more than eighty were present; speeches were made, and harmony and good feeling prevailed until the hour of separation arrived.

THE NEW JERSEY PHARMACEUTICAL ASSOCIATION held its sixth annual meeting in the assembly room of Masonic Hall, New Brunswick, on Wednesday, May 17th, 1876. The meeting was called to order by the President, J. L. DelaCour, and, after delivering his annual address, an election for officers for the ensuing year was held with the following result: President, H. P. Reynolds, of Plainfield; Vice-Presidents, A. S. White, Mount Holly, and Wm. M. Townley, Newark; Treasurer, Wm. Rust, New Brunswick; Recording Secretary, A. P. Brown, Camden; Corresponding Secretary, C. B. Smith, Newark; Standing Committee, G. A. Mangold, Trenton; J. H. Van Deursen, New Brunswick; Charles Holzhauer, Newark; R. J. Shaw, Plainfield.

On account of the Centennial Exposition, in Philadelphia, the local committee were unable to prepare an exhibition of drugs, but invitations were extended to visit the hard and soft rubber factories, the brussels carpet factory and the hosiery factory, and, after the morning session, the members, with their ladies, spent about two hours in examining the above-named places.

The next annual meeting will be held in Newark, and the Association decided not to hold any summer meeting, and not to issue any proceedings this year.

CINCINNATI COLLEGE OF PHARMACY.—The third pharmaceutical meeting was held May 10th, F. L. Eaton in the chair. After the approval of the minutes, the following donations were made to the cabinet. From H. F. Reum, select specimens of Ceylon cinnamon, cassia lignea and cassia barks, from Saigon, Batavia, China and Java. Mr. Reum, in his remarks, criticized, very severely, the substitution of the cassia bark for the real Ceylon cinnamon, when prescribed.

Prof. Wayne presented the two alkaloids of veratrum viride, veratroidia[1] and jervia; also arbutin, prepared from uva ursi; the oils of stramonium and lobelia seeds, the root of the osage orange and the crystallizable resin of the fluid extract of eucalyptus.

The Professor also submitted a formula for New Orleans mead, which he had used for years, and the product of which had always met with a ready sale. It is as follows: eight ounces each of sarsaparilla, liquorice root, ginger and cassia barks, two ounces of cloves and three ounces of coriander, suitably cut and bruised, are boiled for fifteen minutes, in eight gals. water, allowed to cool and settle, and then strained through flannel. To this is added, in the fountain, 1½ gal. syrup, ½ gal. honey, four ounces each of tincture of ginger and solution of citric acid, and, afterwards, sufficient water to make ten gallons, when it is charged with carbonic acid gas.

At the next meeting, Prof. Judge will read a paper on dilute phosphoric acid, and Prof. Fennel one on a new series of alums.

The board of trustees having, at their last meeting, unanimously elected Prof. Wayne to the degree of Doctor in Pharmacy, the President, at this meeting, conferred the degree and presented the diploma. Prof. Wayne, in receiving this unsolicited honor, responded in appropriate terms.

THE PHARMACEUTICAL ASSOCIATION OF THE PROVINCE OF QUEBEC.—At the Spring examination, fourteen candidates presented themselves for the degree of *Certified Clerk*, and two for the degree of *Licentiate in Pharmacy*; six were rejected in the minor and one in the major examination.

This Association is the sole examining and licensing body in the province, being incorporated by act of parliament. In order to furnish instruction by lectures, the association has organized a College of Pharmacy (see "Amer. Jour. Phar." 1875, p. 427), which institution has not the power to license.

EDITORIAL DEPARTMENT.

THE SANITARY CONDITION OF PHILADELPHIA is of general interest during the present year, when many visitors will be attracted to this city by the International Exposition, and reliable information on this subject will for this reason be welcome to all contemplating to view the grand collection of the products of nature and of

[1] Veratroidia, according to Mr. Bullock's recent investigations (see April No., p. 153), is merely jervia, contaminated with resin.—EDITOR AMER. JOUR PHARM.

art and science from all parts of the globe. The following communication will furnish this information:

United States Centennial Commission—International Exhibition, 1876, Philadelphia—Bureau of Medical Service.—Owing to the very large number of persons who contemplate a visit to Philadelphia during the coming summer, it seems important that the utmost publicity should be given to all facts bearing on the sanitary condition of the city.

The following statistics, which have been obtained from the most authentic sources accessible, represent the mortality in some of the chief cities of the world during the past four or five years:

	Number of Years.	Average Population.	Average Total Mortality.	Average Death Rate per Thousand.
Vienna	5	648,560	20,424	31·42
New York	5	994.458	29,601	29·93
Berlin	4	950,000	28,420	29·91
London	5	3,284,488	76,741	23·33
Paris	4	1,851,792	42,724	23·06
Philadelphia	5	744,831	16,573	22·27

While thus showing an average rate of mortality more favorable than that found in any other city containing over 500,000 inhabitants, Philadelphia has recentiy (1874) attained a degree of healthfulness almost unparalleled, viz., with a population at that time of 775,000, the number of deaths was but 14,966, giving a death rate of only 19·3 per thousand. These very favorable results are largely due to the abundant and cheap water-supply, and to the opportunities given, even to the poorest citizens, for the enjoyment of pure country air in the great Fairmount Park, which contains 2,991 acres. The extent to which this is valued by the citizens may be inferred from the fact that during the year 1875, the Park was visited by over eleven million persons.

The most powerful influence of all, however, is the absence of that overcrowding of the population, which is the most fruitful source of sickness and death in many quarters of nearly all other large cities. This will be more clearly comprehended when it is remembered that the 817,488 inhabitants of Philadelphia are spread over an area of 129¼ square miles, which are traversed by more than one thousand miles of streets and roads; and that the city contains, in addition to other kinds of buiidings, 143,000 dwelling-houses occupied by families,—a number exceeding by over 40,000 that of any other city in America.

The climate of Philadelphia is also, on the whole, a favorable one, although presenting many of the peculiarities common to inland localities. The mean annual temperature of the last ten years is 53 73° Fahrenheit; the average annual rain-fall is about forty-five inches.

The following table exhibits the mean temperature of each month for the past ten years, showing that the range is far less extreme than is found in many other less favorably situated localities:

Mean Temperature (Fahrenheit) of Each Month during the Past Ten Years.

January.....32·72° F.	May.....63·24° F.	September.....67·72° F.
February.....33·12 "	June.....73·54 "	October.....56·03 "
March.....39·16 "	July.....78·74 "	November.....43·34 "
April.....53·36 "	August.....75·92 "	December.....33·92 "

It is thus seen that only during the months of June, July and August does the mean temperature rise to a high point. During this period there are very rarely any prevailing epidemic diseases; and the chief mortality occurs among children, especially among the poorer classes.

The health of Philadelphia at present is unusually good. Timely efforts have been made to secure an abundant water-supply to meet the great increase in the demand which must be expected this summer as compared with previous years. Constant watchfulness will be exercised by the authorities to maintain cleanliness, and to avoid or remove every possible cause of disease.

Within the Exhibition grounds a rigid sanitary inspection will be maintained, under the control of the Bureau of Medical Service; and thus a guarantee will be afforded that no cause of infection or disease will be allowed to occur through neglect of this important duty.

The object of this circular has been to call attention to the unusual sanitary advantages of Philadelphia, and to the preparations which have been made to insure the highest possible degree of healthfulness during the approaching Exhibition season. It is proposed to issue at certain intervals other circulars, announcing in an official and accurate manner the sanitary condition of the city, so that entire security may be felt by all who desire to visit the Centennial International Exhibition.

15th April, 1876. WILLIAM PEPPER, M.D., *Medical Director.*

SOLUTION OF TARTRATE OF SODIUM has, to some extent, replaced the citrate of magnesium as a laxative medicine. The various formulas which have been published direct the combination of tartaric acid with crystallized carbonate of sodium, a salt which, on exposure to the air, readily parts with a considerable proportion of its water of crystallization, and is therefore with difficulty kept of a uniform composition, unless it be dehydrated. In view of this, it is rather surprising that the employment of the more stable and uniform *bicarbonate* of sodium has not been proposed heretofore. Mr. H. M. Wilder informs us that he has made the solution for some time, by combining sod. bicarb. ℥vss with acid. tartar. ℥ivss, using four pints of water for dissolving them. Into each bottle is put 1½ fluidounces of simple syrup, 2 or 3 drops of spirit of lemon, the bottle is filled with the solution of sodium tartrate, after which 45 grs. of crystallized citric acid are added, and the bottle corked.

The taste of this solution differs from that of magnesium citrate, and appears to be more acceptable to the majority of patients, while in laxative effects the two are probably about alike.

AMERICAN CHEMICAL SOCIETY.—At the "Centennial of Chemistry," celebrated by a number of American chemists at Northumberland, Pa., August 1st, 1874, it was proposed to form a national chemical society. The proposition was not then favorably entertained; the establishment of a chemical section in connection with the American Association for the Advancement of Science, appeared to the majority of those present to meet all necessities. The advantages of a national chemical society, however, have been so apparent in England, France and Germany that the proposition of several New York chemists to form a similar society in this country met with such a hearty response from all sections of the United States, that during the past month the American Chemical Society was established with 53 resident (within a radius of thirty miles from New York) and 80 non-resident members. The officers for the current year are: Prof. J. W. Draper, New York, President; J. L. Smith, Kentucky, F. A. Genth, Pennsylvania, E. W. Hilgard, California, J. W. Mallet, Virginia, C. F. Chandler, New York, and Henry Morton, New Jersey, Vice Presidents; George F. Barker, Pennsylvania, Corresponding Secretary; Isidor Walz, New York, Recording Secretary; H. M. Habirshaw, New York, Treasurer, and P. Casamajor, New York, Librarian.

The objects of the Society are the encouragement and advancement of chemistry in all its branches, in furtherance of which monthly meetings will be held in the city of New York on the first Thursday of every month, and it is contemplated to hold one meeting in each year outside of New York city, at such a time and in such

a place as to make attendance on the part of non-resident members more convenient and representative. It is likely that the first one of these meetings will be held in Philadelphia during the approaching summer.

Chemists desirous of becoming members of the American Chemical Society, should address the Committee on Nominations, Post-office box, 1,396, New York City.

THE LIEBIG MONUMENT.—We learn from German papers that the collections for the proposed Liebig Monument amount thus far to 140,000 marks (nearly $35,000). It is intended to erect the monument upon the Dult Place in Munich, but neither has the artist been selected, nor has a design been formally adopted.

MURDEROUS ATTACK IN A LABORATORY.—Prof. Otto, of the Polytechnic School at Brunswick, Germany, was attacked by an employee at the pharmaceutical and chemical laboratory and seriously wounded, toward evening of April 22d. It appears that the professor had censured the man for carelessly breaking an apparatus, and was afterwards assaulted by him with some blunt instrument, probably a pestle, receiving eight wounds about the head. Fortunately the wounds, although very serious, are not absolutely dangerous, and there is hope of the ultimate recovery of Prof. Otto. The perpetrator of the dastardly act was soon after arrested, and lodged in prison, where he put at end to his life by hanging.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

C. H. Hobbs' Botanical Text-book of common, local, English, Botanical and Pharmacopœial Names, arranged in alphabetical order, of most of the crude Vegetable Drugs, &c., in common use; their Properties, Productions and Uses in an abbreviated form. Especially designed as a reference-book for Druggists and Apothecaries. In Three Parts. Compiled and published by Chas. E. Hobbs, Boston: 1876. Large 8vo, pp. 271. Price $3.50.

The very lengthy title of this book is almost sufficient to give a synopsis of its contents. The first part, which is headed ENGLISH, contains three columns, respectively marked *Common*, *English* and *Botanical*, the latter containing the botanical names of the plants, and the second column the English names more generally employed, while the first column aims at giving *all* the English names of more local use, and including likewise the names found in the second column. We fully recognize the difficulty of such an arrangement, and it could hardly be otherwise but that discrepancies should be found here; thus for instance for the common name of *acorn* the English *Fruit of the oak* is given, while for *Anise, common* the English *Anise* SEED is used. We rather expected the second column to contain the definition of the word of the first column, an idea which is really carried out in some portions of the first part, like under the head of *oils*, where the second column usually defines the nature of the oil, whether fixed, expressed, distilled, &c., and the part of the plant from which it is obtained.

The second part, entitled BOTANICAL, likewise contains three columns, in the first of which the botanical names and some of their synonyms are given in alphabetical order; in the second the common English names, and in the third the part of the plant employed and its medicinal properties. The latter portion is given abbreviated and an explanatory table of the abbreviations used precedes the second part.

The third part, headed PHARMACOPŒIAL, has in the first column the names as officinal in the United States, British or German pharmacopœias, or as still occasionally employed. In the second and third columns are found the corresponding common and botanical name. The first column may serve to some extent for comparing the system of nomenclature adopted by the three pharmacopœias, as for instance Gentiana, Gentianæ radix and Radix Gentianæ are the names of the U. S., Br. and Ger. pharmacopœias indicating the same drug, viz., the root of Gentiana lutea.

An appendix contains an alphabetical list of the German names of the crude vegetable substances officinal in the German pharmacopæia, a second column giving the Latin officinal and a third column the botanical name.

The mechanical part of the work is satisfactory. The types are clear, and although we have observed occasional misspelling, we have not observed any incorrectness.

We have entered thus extensively into the arrangement and character of the work before us, because we believe it to be a very valuable one for druggists as well as pharmacists, the first part being perhaps the one of greatest *practical* value in determining the meaning of the numerous common names of mere local use, of which names not less than 8,000 are enumerated in the first column; and yet full and complete as this list is, we have incidentally observed that one reference has been overlooked, and mention this here merely for the purpose of referring to an erroneous statement published twenty-one years ago which has remained uncorrected ever since. Having had occasion recently to refer to a communication by H. G. and L. B Hotchkiss in the "Amer. Jour. Phar.," 1855, p. 222, the statement attracted our attention that the weed most commonly found in peppermint plantations was "by some called broomweed, by others mare's tail (Hippuris vulgaris.)" The plant mentioned, however, is rather rare in this country and is *never* found in mint plantations because it is an aquatic plant; mare's tail is merely one of the numerous synonyms by which Erigeron Canadense is known in some localities (see "Amer. Jour. Phar.," 1870, p. 121.)

Jahresbericht über die Fortschritte der Pharmacognosie, Pharmacie und Toxicologie, bisher herausgegeben von Dr. A. Wiggers und Dr. A. Husemann, fortgesetzt von Dr. G. Dragendorff, ord. Prof. der Pharmacie in Dorpat. Neue Folge; 9 Jahrgang, 1874. Göttingen: Vandenhoeck & Ruprecht's Verlag, 1875. 8vo, pp. 549.

Annual report on the Progress of Pharmacognosy, Pharmacy and Toxicology, for 1874.

We have seen this annual report only recently, through the kindness of Mr. Wilder, else it should have received an earlier notice. After the publication of the report for 1873, the venerable Prof. Wiggers declined its further preparation, owing to his advanced age, and Prof. Husemann found his time so much occupied as to

be unable to contribute the compilation of the toxicological researches. Prof. Dragendorff then agreed to furnish the report, and although the time for accomplishing this has been very limited, he has, aided by Messrs. E. Masing, E. Johannson, Nentwich and Prof. Morel, succeeded in producing a volume which is in every way a worthy successor of the long series of thirty volumes edited by Prof. Wiggers.

The arrangement of matter remains nearly unaltered, and the selections are as complete and the references to the various journals as full and accurate as to leave nothing to desire. We confess, however, to have been somewhat surprised in finding enumerated in the bibliographical list a work on new-school remedies, by the notorious Dr. Paine, which would not have received the same compliment on this side of the Atlantic.

Twelfth Annual Report of the Alumni Association of the Philadelphia College of Pharmacy. 1876. 8vo, pp. 46.

The pamphlet contains Prof. Remington's Valedictory Address, Mr. Eberle's Annual Address, the President's Report, an account of the Annual Reception in March last, Minutes of the Meetings of the Association and of the Executive Board, etc. We learn from the minutes that, in addition to the Alumni prizes mentioned on page 186 of our April number, a silver medal has been awarded by the Executive Board to Mr. Henry Schroeder, of Chicago, besides the certificate of proficiency received by him in March; also, a certificate of proficiency in chemistry to Mr. J. C. Martin, of Allegheny City.

OBITUARIES.

ANTOINE JEROME BALARD, member of the Paris Academy of Sciences and Professor of Chemistry at the College de France, died in Paris, last April, after a short illness, which, for several months, had been preceded by a gradually-increasing debility. Balard was born at Montpellier in 1802, received a thorough pharmaceutical education, and was afterwards attached, as *Préparateur de Chimie*, to the School of Pharmacy and Faculty of Sciences of his native city. While laboring in this capacity, he liberated from the ashes of seaweed a new element, to which he gave the name of *bromine*. The essay announcing this discovery was published in 1826, and contained extended researches by which the young discoverer proved its chemical analogy to the previously-discovered elements, chlorine and iodine. This discovery was made only a short period after the opposition against the elementary nature of chlorine had ceased; its effect upon the alkalies and alkaline earths, however, could not be harmonized with existing theories, until in 1834 Balard announced the discovery of *hypochlorous acid*, and explained the chorinated compounds mentioned as mixtures of chlorides and hypochlorites. Amongst Balard's researches which were destined to have an important bearing upon industrial arts, should be mentioned yet his investigations upon the salts of sea-water, with a view of utilizing, besides the sodium, also the potassium salts.

The gradual development of the theories relating to organic chemistry was materially aided by Balard, among the most important of his discoveries in this direction being the preparation (1841) from binoxalate of ammonium, of *oxamic acid*, the representative of the limited class of amin acids, and (1844) the separation of *polymeric compounds of amylene*, while attempting to prepare the latter from amylic alcohol.

In 1842, he was called to Paris to fill the chair of Chemistry in the Faculty of Sciences, formerly occupied by Thénard, and since 1851 he labored in a like capacity at the Collége de France.

Balard's researches were characterized by great exactness and minuteness, leaving to others very little, if anything, to correct. Amongst the pharmacists whose scientific labors have, directly or indirectly, created great industrial pursuits, his name stands among the first ranks. He was an honor to his profession and to the science to which his inclinations were directed; kind of disposition and free from envy or jealousy, he was always ready with valuable advice to aid the investigations of others.

MICHAEL DONOVAN, M. R. I. A., died in Dublin, March 27th, at the advanced age of 85 years. His name is well known to American pharmacists as the originator, in 1839, of Donovan's Solution, the Liquor Arsenici et Hydrargyri Iodidi, of the "U. S. Pharmacopœia." In former years, Mr. Donovan paid much attention to electricity and electro-chemistry, but at a later period was almost exclusively devoted to pharmacy, contributing quite a number of papers to several journals, several of which were reproduced in the earlier volumes of this journal. Amongst the more recent ones may be mentioned the "Historical sketch of the dismemberment of pharmacy from physic" (1868), "On the process for preparing James' powder" (1869) and "On tincture of hyoscyamus" (1871).

DR. JEAN FRANÇOIS VLEMINCKX died at Brussels, March, 17th, in the 76th year of his age. The deceased was widely known for his researches in hygiene, and had labored for many years in the sanitary service of the Belgian army, in which service, at the time of his demise, he held the honorary position of Inspector-General. He was one of the founders and President of the Royal Academy of Medicine, since 1864 a member of the Chamber of Deputies, and held many other positions of trust and honor.

DR. J. S. UNZICKER died at Cincinnati, April 18th, of apoplexy, aged 63 years. He was a native of Germany, but had been practising medicine in Cincinnati for many years. He was a member of the Cincinnati Academy of Medicine, and always took a lively interest in the progress of pharmacy.

JOSEPH N. HENDERSHOTT, a native of Bloomsburg, Pa., and during last winter a student at the Philadelphia College of Pharmacy, was suddenly taken sick on the evening of the Commencement, March 14th, and died of typhoid fever on the 20th of the same month, aged 22 years. He was an active and promising student, and of a genial disposition.